DOCUMENT RESUME

ED 247 460 CE 039 561

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TITLE	Item Operating Characteristics of the Armed Services Vocational Aptitude Battery (ASVAB), Form 8a.
SPONS AGENCY	Office of Naval Research, Washington, D.C. Psychological Sciences Div.
PUB DATE	1 Mar 84
CONTRACT	N00014-83-C-0283
NOTE	73p.
PUB TYPE	Reports - Research/Technical (143) -- Statistical Data (110)
EDRS PRICE	MF01/PC03 Plus Postage.
DESCRIPTORS	Adolescents; Aptitude Tests; Military Personnel; Military Training; National Surveys; *Occupational Tests; Postsecondary Education; Sampling; Scores; Secondary Education; *Statistical Analysis; Test Interpretation; Test Items; *Test Norms; *Vocational Aptitude; Vocational Education; *Vocational Evaluation; Young Adults
IDENTIFIERS	*Armed Services Vocational Aptitude Battery; *Item Parameters; Profile of American Youth; Project

ABSTRACT

The Armed Services Vocational Aptitude Battery (ASVAB), a battery of 10 vocational tests, was administered to a national probability sample of nearly 12,000 young people, 15 to 23 years of age. Score distributions from the study were needed by the Armed Services to set performance levels for accepting and assigning recruits. Three psychometric models designed to provide information about the operating characteristics of the tests and the items of which they are comprised were fit to the eight "power" tests of the ASVAB, based on a random sample of 1,187 respondents from the national study. The models in question were the one-, two-, and three-parameter item response models that were fit to the data by the marginal estimation approach by means of the BILOG computer program. Results for each model and test included indices of overall goodness-of-fit, item parameter estimates and associated standard errors, item information indices, and test information and standard error curves. Appendixes contain the results of the analyses. Appendix A contains classical item statistics for each of the tests, including item percents-correct and item-test correlation, both Pearson and biserial. Appendixes B through J present results from the BILOG runs under the one-, two-, and three-parameter models. (YLB)

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ITEM OPERATING CHARACTERISTICS OF THE ARMED SERVICES VOCATIONAL APTITUDE BATTERY (ASVAB), FORM 8A

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ABSTRACT

The Profile of American Youth study carried out in 1980 by the Department of Defense with the cooperation of the Department of Labor obtained responses from a national probability sample of young people between the ages of 16 and 23 to the tests of the Armed Services Vocational Aptitude Battery (ASVAB). This report contains the results of item analyses of the eight power tests of the ASVAB, based on a random sample of 1187 respondents from the Profile study. The 1-, 2-, and 3-parameter logistic ogive item response models were fit to the data by marginal estimation methods. Indices of overall fit, item parameter estimates and their standard errors, item information indices, and test information and standard error curves are presented.

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This research was sponsored by the Psychological Services Division, Office of Naval Research, under Contract No. N00014-83-C-0283.

INTRODUCTION

The Profile of American Youth is the title given to a large-scale social research project sponsored by the Department of Defense with the cooperation of the Department of Labor. Its purposes were to assess the vocational aptitudes of contemporary American Youth and, at the same time, establish current national norms for the Armed Services Vocational Aptitude Battery (ASVAB). To achieve these goals, the National Opinion Research Center (NORC) administered Form 8A of the ASVAB during the summer of 1980 to a national probability sample of nearly 12,000 men and women, ages 16 to 23. This paper reports the results attained when three psychometric models designed to provide information about the operating characteristics of the tests and the items of which they are comprised were fit to the eight "power" tests of the ASVAB battery, using responses from a 10-percent random sample of the Profile data. The models in question were the one-, two-, and three-parameter item response models (Birnbaum, 1968; Lord, 1980), which were fit to the data by the marginal estimation approach described by Bock and Aitkin (1981) by means of the BILOG computer program (Mislevy and Bock, 1983). Results for each model and test include the following:

- Indices of overall goodness-of-fit
- Item parameter estimates and associated standard errors
- Item information indices
- Test information curves

All calculations utilized Profile case weights which account for systematic oversampling of certain demographic groups such as blacks, Hispanics, and poor non-Black, non-Hispanics. The resulting estimates of item parameters and population distributions therefore approximate the values that would be obtained in a full census of the target population, namely the

contemporary youth population. In this way the current results provide information beyond that present in previously available analyses of the ASVAB, based of necessity on data from samples of convenience such as recent service inductees.

THE PROFILE OF AMERICAN YOUTH

During the spring and summer of 1980, the National Opinion Research Center (NORC) administered a battery of ten vocational tests to a national probability sample of nearly 12,000 young people, 15 to 23 years of age. The tests, the Armed Services Vocational Aptitude Battery (ASVAB), Form 8A, were the latest in a long series of aptitude and vocational tests developed by the Armed Services for purposes of selecting recruits and assigning them to military occupational specialties. A basic purpose of this administration of the ASVAB by NORC was to obtain normative information in a representative contemporary civilian sample. The score distributions from this study were needed by the Armed Services to set performance levels for accepting and assigning recruits. The Profile of American Youth used for its sample the 12,686 young people who completed the Round I 1979 first annual interview of the National Longitudinal Survey of Labor Force Behavior, Youth Survey. The sample was composed of three independent probability samples. Two of these samples were designed to cover the non-institutionalized civilian population born in the years 1957 through 1964. The third sample was designed to cover those born in 1957 through 1961 and serving in the military as of September 30, 1978.

The first of the two civilian samples was cross-sectional, designed to yield the proper proportions of various racial, ethnic, and income groups in the 1957 through 1964 cohort. The second was a supplemental sample designed

to oversample Hispanic, Black, and economically disadvantaged non-Black, non-Hispanic youth. The military sample of the 1957 through 1961 cohort, stratified by branch of military service and geographic location, sampled females at six times the rate of males.

Because not all subjects in the final sample had the same probability of being selected for the study, case weights were assigned to the subjects. The weighted data properly reflect the actual distributions of the oversampled groups in the population. Of the 12,686 young people in the Profile sample, 11,914 were successfully tested with the ASVAB. Test conditions were altered for 36 of these subjects because of handicaps or language barriers; these data were not included in our consideration. Of the remaining 11,878 subjects, a 10 percent simple random sample of 1,187 subjects has been selected for the present analyses.

The reader interested in further information about the Profile study is referred to a series of reports prepared by NORC and the Department of Defense. See Sheatsley (1980) for a description of pretest procedures and results, Frankel and McWilliams (1981) for sampling considerations, McWilliams (1980) for field administration procedures, Bock and Mislevy (1981) for data quality analyses, and Department of Defense (1982) and Bock and Moore (1983) for discussions of results.

THE ARMED SERVICES VOCATIONAL APTITUDE BATTERY (ASVAB)

The ASVAB 8A consists of ten tests, administered and timed separately. Briefly, these are as follows:

> General Science (20 items; 11 minutes). Items are drawn from biology, medicine, chemistry, and physics. This test measures basic factual knowledge at a level appropriate to secondary school general science courses.
>
> Arithmetic Reasoning (30 items; 36 minutes). Often called "word problems," the items in this test require subjects to

use arithmetic skills to solve problems described in short verbal passages. Advanced mathematics is not required.

Word Knowledge (35 items; 11 minutes). Essentially a vocabulary test. The subject is presented a word and asked to choose which of four other words is closest in meaning.

Paragraph Comprehension (15 items; 13 minutes). Designed to measure how well subjects can acquire information from a written passage. Subjects are asked to read short paragraphs and answer questions about them.

Numerical Operations (50 items; 3 minutes). This test covers the basic arithmetic operations of addition, subtraction, multiplication, and division, presenting simple problems which subjects are asked to solve as quickly as possible. Scores depend to a great extent on speed and accuracy.

Coding Speed (84 items; 7 minutes). Like Numerical Operations, this test emphasizes speed and accuracy. Given the code numbers for key words at the top of a page in the test booklet, subjects are asked to mark spaces on their answer sheet corresponding to the code numbers of the words as quickly as possible.

Auto and Shop Information (25 items; 11 minutes). This test measures subjects' specific knowledge of tools and terms associated with the repair and maintenance of vehicles.

Mathematics Knowledge (25 items, 24 minutes). The questions in this test concern topics that are normally taught in high school classes such as algebra, geometry, and trigonometry.

Mechanical Comprehension (25 items; 19 minutes). Items in this test show pictures related to basic machines such such as pulleys, gears, levers, and wedges. To answer the questions, subjects must visualize how the pictured objects would operate.

Electronics Information (20 items; 9 minutes). This test measures subjects' familiarity with electrical equipment, knowledge of electronics terminology, and ability to solve simple electrical problems.

All subtests are paper and pencil tests, in multiple-choice format. The items in all tests offer four alternatives from which the subject must choose their answers, except for Coding Speed which offers five alternatives. Subjects read the questions from test booklets and responded on

machine-readable answer sheets. Subjects were instructed to make their best response to each item, but random guessing was discouraged.

Two of the ten ASVAB 8A subtests, Numerical Operations and Coding Speed, are speeded tests in which performance depends mainly on subjects' speed and accuracy at very simple tasks in a limited amount of time. The remaining eight are power tests, in which performance depends mainly on subjects' knowledge or reasoning abilities rather than on time limitations. The analyses reported here concern the power tests only.

THE ANALYSES

A power (unspeeded) mental test demands knowledge or reasoning ability from a subject. Although time limitations are set and observed, it is assumed that subjects would answer few additional items correctly if given more generous time limits.

The models used in the present analysis of the ASVAB 8A power tests are based on Birnbaum's (1968) 3-parameter logistic item response theoretic (IRT) model, which provides a mathematical expression for the probability that a given subject will respond correctly to a given test item. When the model is fitted to the data for a given power test, it is capable of accounting for the following facts:

1. Some subject perform better than others on the items in that test. The ability, or scale score, of subject i (θ_i) is his or her value on an unobservable variable assumed to account for all non-random variation among subjects in performance on of correct response.

2. Some items are easier than others. The threshold parameter of item j (b_j) indicates its level of difficulty. A subject whose ability parameter has the same value as an item's threshold parameter has 50-50 chances of responding correctly, aside from guessing among the alternatives.

3. Some items measure the underlying ability more accurately than others. The slope parameter of item j (a_j) is directly related to the reliability with which item j measures ability.

4. Because the items are multiple-choice, subjects will occasionally respond correctly to an item by guessing among the alternatives. The lower asymptote parameter of item j (c_j) is the probability of a correct response from even the subjects of lowest ability.

Under the Birnbaum 3-parameter item response model, the probability of a correct response to item j from a subject with ability θ is given by the following function of θ, a_j, b_j, and c_j:

$$P_j(\theta) = c_j + (1 - c_j)/\{1 + \exp[-1.7a_j(\theta - b_j)]\}$$

where $\exp(x)$ denotes the raising of the base of the natural logarithms to the x'th power. Seen as a function of θ with the parameters of the item fixed, this expression is referred to as the response curve of item j.

We have also fit to the ASVAB data two submodels of the 3-parameter model. They are the 2-parameter logistic model, in which all lower asymptote parameters c_j are constrained to be zero, and the 1-parameter logistic model, in which all c's are zero and all a's are constrained to be equal to one another. This latter model is mathematically equivalent to Rasch's (1960) IRT model for dichotomous test items.

The origin and scale of the ability variable in an IRT model may be chosen arbitrarily. In our analyses the scale has been set so that the mean of subject abilities in the youth population is zero and the standard deviation is one.

Birnbaum (1968) defines the "information" that item j provides about subjects at various levels of ability by

(1) $$[P_j'(\theta)]^2/\{P_j(\theta)[1 - P_j(\theta)]\} \quad ,$$

where $P_j'(\theta)$ is the derivative of the response curve for item j. For the 3-parameter logistic model, the information function takes the following form:

$$I_j(\theta) = 1.7^2 a_j^2 \psi[1.7a_j(\theta - b_j)]$$

(2)

$$-1.7^2 a_j^2 P_j^2(\theta)\psi[1.7a_j(\theta - b_j) - \log c_j] \quad ,$$

where

$$\psi(x) = \exp(x)/[1 + \exp(x)]^2 \quad .$$

The maximum value of an item's information curve under the the 3-parameter model is given by

$$\frac{1.7^2 a_j^2}{8(1 - c_j)^2}[1 - 20c_j - 8c_j^2 + (1 + 8c_j)^{3/2}] \quad ,$$

which occurs at the following level of ability:

$$\theta_j^* = b_j + (1.7a_j)^{-1}\log\{[1 + (1 + 8c_j)^{1/2}]/2\} \quad .$$

Obvious simplifications give the information functions of the 1- and 2-parameter models.

Examination of (1) reveals the dependence of the information curve upon the values of the item parameters. An item provides most information about subjects in the neighborhood of its threshold; the maximum value is attained at the threshold if c is zero and at a slightly higher level of ability when c is greater than zero. At their most informative points, items with large values of a provide more information than items with small values of a. The greater the value of c, the less total area under the information curve.

The total amount of information provided by a collection of items, given by the sum of their individual item information curves, is called the test information curve. The standard error of estimation for the ability of a

subject at a given value of is the square root of the reciprocal of the test information at that point. A test information curve, then, reveals the degree of measurement precision provided at each point along the ability scale; measurement is most precise where the test information curve attains its maximum, and increasingly less precise where the test information is lower.

The method by which item parameters have been estimated is based on the marginal maximum likelihood approach described by Bock and Aitkin (1981). Let x_{ij} denote the response of subject i to item j, taking the value 1 if correct and 0 if not, and let $g(\theta)$ be the density of the ability variable in a population of interest. The marginal probability of observing response patterns $\underline{x}_i = (x_{i1}, x_{i2}, \ldots, x_{in})$ for N randomly-selected subjects indexed by i is then given as

$$L = \prod_i \int_\theta \prod_j P_j(\theta)^{x_{ij}} [1 - P_j(\theta)]^{1-x_{ij}} g(\theta) d\theta \quad .$$

Marginal maximum likelihood estimates of $\underline{a}$, $\underline{b}$, and $\underline{c}$ are the values that maximize this expression for given item responses. Standard errors of estimation may be obtained as the square roots of the diagonal elements of the following approximation of the Fisher information matrix:

$$I = \sum_i \left[\frac{\partial \log L(\underline{x}_i)}{\partial \xi}\bigg|_{\underline{\xi} = \hat{\underline{\xi}}}\right]\left[\frac{\partial \log L(\underline{x}_i)}{\partial \underline{\xi}'}\bigg|_{\underline{\xi} = \hat{\underline{\xi}}}\right] \quad , \tag{3}$$

where $\underline{\xi}$ is the vector of all item parameters estimated under a given model, the summation runs over subjects, and

$$\frac{\partial \log L(\underline{x}_i)}{\partial \xi} = \left[\int_\theta \frac{\partial \log P(\underline{x}_i|\theta)}{\partial \underline{\xi}} P(\underline{x}_i|\theta) g(\theta) d(\theta)\right]\left[\int_\theta P(\underline{x}_i|\theta) g(\theta) d(\theta)\right]^{-1} \quad .$$

The fit of nested models, such as the 1- vs. 2- and the 2- vs. 3-parameter models, may be compared by means of likelihood ratio chi-square statistics. If L_1 is the maximum likelihood attainable under the less restrictive model and L_0 is the maximum under the more restrictive model, then under the assumption that the more restrictive model is correct the quantity

$$\chi^2 = -2 \log(L_0/L_1)$$

will be distributed approximately chi-square for large samples, with degrees of freedom equal to the number of additional parameters in the less restrictive model.

In addition to the overall indices of fit, rough approximations of fit have been provided for each item. These indices are obtained by dividing the ability variable into ten fractiles, the middle eight of equal length, in a manner that ensures about 5 percent of the calibration sample lies within each of the extreme fractiles. For the subjects in each fractile, then, the number of correct responses to a given item is accumulated over subjects and compared with an expectation based on the simplifying assumption that all subjects in the fractile have the same ability. An index with the appearance of a chi-square statistic is obtained as

$$\chi_j^2 = \sum_k [R_{jk} - N_{jk} P_j(\theta_k)]^2 / \{N_{jk} P_j(\theta_k)[1 - P_j(\theta_k)]\} \quad ,$$

where summation runs over fractiles k; N_{jk} and R_{jk} are the numbers of attempts and corrects to item j from subjects in fractile k; and $P_j(\theta_k)$ is the probability of a correct response ability associated with fractile k.

The computations reported here were performed with the BILOG computer program (Mislevy and Bock, 1983), which extends the Bock-Aitkin procedure in a

number of minor ways (see Mislevy and Bock, 1982). In particular, the following extensions were in effect during the course of our work:

1. Prior distributions on item parameters. To enhance the stability of item parameter estimation, mild Bayesian prior distributions were imposed in the 2- and 3-parameter solutions. For both the 2- and 3-parameter solutions, lognormal priors with mean 0 and standard deviation 1 were assumed for slope parameters. For the 3-parameter solution, normal priors with mean 0 and standard deviation 2 were additionally assumed for threshold parameters, and beta priors with parameters 5 and 17 were assumed for asymptote parameters. The prior on asymptotes may be interpreted as an expectation of .2 for asymptotes, with the weight of 20 observed responses from low-ability subjects.

   Instead of maximum likelihood estimates, BILOG will in these runs produce Bayes modal estimates of item parameters; the likelihood of the sample will no longer be maximized, and differences between the likelihoods as evaluated at the item parameter estimates no longer follow chi-square distributions. Experience suggests, however, that when only mild priors such as those mentioned above are imposed, the effect is constrain item parameters to "reasonable" values without substantially reducing the likelihood as evaluated at the item parameter estimates. Differences are therefore reported as possibly useful evidence on comparative model fit.

   Indicators of the precision of item parameter estimation are obtained for Bayes modal estimates by augmenting the approximation of the information matrix shown as (3) by the second derivatives of the priors for the parameters in question, evaluated at the Bayes modal estimates, then taking the square roots of the diagonal elements of the inverse matrix.

2. Omitted items were handled in one of two ways, depending on their locations in a subject's response vector. It was assumed that all omitted items appearing after a subject's last actual response in a subtest were not reached due to time limitations; such items have been treated as if they were not administered to the subject. Omitted items appearing before a subject's last actual response were treated as if the subject read the item and decided not to respond; they have been counted as incorrect under the 1- and 2-parameter models and fractionally correct under the 3-parameter model, with the fraction equal to the c value of the item in question.

3. As suggested by Bock and Aitkin, empirical priors have been used for the distributions of subject ability parameters. In this way, item parameter estimates will not be bias due to the incorrect specification of the parametric form of the ability distribution, such as normality. The empirical distributions employed took the form of ten equally-spaced quadrature points from approximately minus four to plus four standard deviations around the mean of zero.

4. In addition to an item's maximum information value and the point at which this maximum is attained, BILOG optionally provides a number of population-dependent indices of item information. All are based on the "effectiveness" function, or the pointwise product of an item information curve and a population density function, assumed normal in the analyses reported here.

   The "maximum effectiveness" and "point of maximum effectiveness" describe the height and location of the maximum of the effectiveness curve; they indicate the region of the ability variable where the item is providing most information about the population as a whole. The "average information" is the integral of the product with respect to the ability distribution; it provides a useful adjunct to maximum information when measurement within a particular population with a fixed test is contemplated. For example, an item with a lower maximum but occurring in a region with many subjects may be preferable to an item with a higher maximum but occurring in a region with few subjects. Finally, an index of item reliability is computed as

$$r = \sigma^2/[\sigma^2 + \bar{I}_j^{-1}] \quad ,$$

   where $\bar{I}_j$ is the average information of item j and σ^2 is the population variance. This statistic remains invariant with a linear rescaling of the latent variable, and is thereby useful in comparisons of items from tests on different scales.

RESULTS

The results of the analyses described in the preceding section are contained in a series of appendices to this report.

Appendix A contains classical items statistics for each of the tests, including item percents-correct and item-test correlations, both Pearson and biserial. All these values take case weights into account, so they approximate the values that would be obtained from the youth population at large.

Appendices B through J present results from the BILOG runs under the 1-, 2-, and 3-parameter models. Results within appendices are arranged by subtest, with the contents of the appendices as follows:

B: Item parameter estimates, 1-parameter model

C: Item parameter estimates, 2-parameter model

D: Item parameter estimates, 3-parameter model

E: Item information indices, 1-parameter model

F: Item information indices, 2-parameter model

G: Item information indices, 3-parameter model

H: Test information curves, 1-parameter model

I: Test information curves, 2-parameter model

J: Test information curves, 3-parameter model

The scales upon which test information and standard error curves appear in Appendices H through J are the same for all subtests under a given model. In this way, the amount of information provided can be easily compared from one subtest to the next.

To facilitate the interpretation of these results, a few comments on the results in general are in order.

The values of the likelihood of the data obtained under each solution, as shown in Table 1, show strong evidence in all tests that the 2-parameter model fits the data appreciably better than the 1-parameter model. Furthermore, the 3-parameter model fits appreciably better than the 2-parameter model in all tests but two, namely Paragraph Comprehension and Electronics Knowledge.

TABLE 1

ASVAB 8A LOG LIKELIHOODS AND LOG LIKELIHOOD DIFFERENCES

TEST	-2 LOG LIKELIHOOD			DIFFERENCES	
	1-P	2-P	3-P	2-P vs. 1-P	3-P vs. 2-P
GS	20059.53	19863.10	19742.56	196.43	120.54
AR	23360.74	23053.63	22900.57	307.11	153.06
WK	22480.19	22003.62	21771.86	476.57	231.76
PC	11570.42	11356.17	11338.76	214.25	17.41
AS	21628.40	21275.61	21214.56	352.79	61.05
MK	20495.99	20160.89	20107.64	335.10	53.25
MC	21934.24	21683.18	21591.61	251.06	91.57
EI	17442.33	17180.68	17163.50	261.65	17.18

The result in Paragraph Comprehension can be explained by noting how easy the items are; over 70 percent of all responses were correct. Under such circumstances there is little information about the response probabilities of low ability subjects, and item response curves without nonzero lower asymptotes can be found to fit the bulk of the data just as well as response curves with nonzero lower asymptotes. The results in Electronics cannot be similarly explained, however, since that test is considerably more difficult than Paragraph Comprehension; about 55 percent responses were correct there. It would appear that in Electronics Information, to a greater extent than in the remaining tests, low levels of guessing were occurring.

It will be noted that even though the 2- and 3-parameter solutions fit Paragraph Comprehension and Electronics Information nearly equally well, item parameter estimates can vary considerably across models. This is particularly true with hard items, when the presence of a nonzero lower asymptote can require substantial changes in slopes and thresholds in order to capture the observed marginal item percents-correct. Item 17 in Electronics Information, for example, has a threshold of 3.654 and a slope of .162 under the 2-parameter

model, but a threshold of 2.764, a slope of .774, and an asymptote of .234 under the 3- parameter model. Despite the apparent discrepancies in item parameters, the 2- and 3-parameter response curves agree closely in the region of the ability scale where most of the data lie. Modeled probabilities of correct response for a subject at the mean of the population are .267 under the 2-p model and .254 under the 3-p model.

Effects of the same phenomenon appear in test information and standard error curves. Even though the item parameter estimates under each solution trace response curves that agree on the expected probabilities of correct response for most of the subjects, differences among models as to the processes that give rise to those probabilities have different implications about the information that is provided about subjects at various levels of ability. The effect is most pronounced in a comparison of information curves from the 2- and 3-parameter solutions, highlights of which are contained in Table 2. It may be seen that the region in which a test is maximally informative appears at substantially higher levels of ability under the 3-parameter model, usually higher by a full standard deviation or more.

TABLE 2

ASVAB 8A POINTS OF MAXIMUM INFORMATION

	POINT OF MAXIMUM INFORMATION		
TEST	1-P	2-P	3-P
GS	-0.71	-1.00	0.92
AR	-0.28	-0.57	0.64
WK	-1.00	-1.14	0.21
PC	-1.07	-1.14	-0.42
AS	-0.28	-0.28	0.64
MK	-0.14	-0.35	0.57
MC	-0.28	-0.42	0.78
EI	-0.28	-0.57	0.14

An intuitive explanation for this finding can be based on the fact that items are most informative when a subject has a 50-50 chance of knowing the answer, aside from the possibility of answering the item correctly by means other than knowledge or ability; e.g., guessing randomly among alternatives. Under the 2-parameter model, percents-correct are taken at face value because it is assumed that only the ability of interest gives rise to correct responses. Under the 3-parameter model, however, the possibility of correct responses by reasons other than ability is taken into account and percents-correct are partially discounted. An item is no longer most informative at its 50-50 point of observed correct responses, but at some higher level at which there is a 50-50 chance of responding correctly after the possibility of chance success has been removed. Since follow-up interviews with a sample of the respondents confirmed that most subjects did in fact guess at least occasionally (Bock and Mislevy, 1981), the information indices from the 3-parameter analyses may be better indicative of the regions where items and tests are more informative than indices from the 1- and 2-parameter analyses.

It should be noted that the ASVAB 8A is merely the latest in a long line of paper and pencil versions of the ASVAB. The test operating characteristics have evolved along lines dictated by the uses to which ASVAB scores are put (i.e., selection and classification), limitations on total testing time, and the restriction of administering exactly the same item set to each tested individual. The consequences of these constraints are examined in detail in Bock and Mislevy (1981), in terms of item content, item characteristics, sex and racial/ethnic group biases, and differential reliabilities among subpopulations defined by sex, level of education, and racial/ethnic group membership. Highlights of these results, however, are discernable from

the item and test operating characteristics presented in the Appendices of this report. Comments on specific tests in the ASVAB 8A battery follow.

General Science (GS). GS is among the more difficult of the subtests, as indicated by the fact that its point of maximum information (under the 3-parameter model) lies about a standard deviation above the population mean. This finding is a natural reflection of the use to which GS scores are put, namely for selection and classification into technical training courses. While the peak of the information curve lies far above the population mean, where candidates for advanced training will be found, it is interesting to note a plateau to the left of the peak, beginning about one standard deviation below the population mean (see Exhibit J-1). This indicates the presence of a number of items evenly spaced in difficulty somewhat below the cluster of more difficult items that create the peak in the information curve. While not as informative in the region where the majority of the youth population lies as for the more able subjects, GS does provide useful information for sorting and comparing individuals over nearly the entire range of aptitude.

Arithmetic Reasoning (AR). AR is among the more reliable ASVAB 8A tests, due partly to its comparatively large number of items (30) and partly to the fact that most are located in a region including the mean of the youth population. The implicit decision to obtain relatively precise measures of the skills tapped by its items, namely the ability to recognize and solve quantitative problems embedded in a verbal context, reflects their importance for success in a wide variety of subsequent training experiences. These skills are to be distinguished from the more advanced mathematical techniques that are the focus of Mathematical Knowledge, critical to success in a narrower range of more technical training.

Word Knowledge (WK). WK is the longest power test in the paper and pencil ASVAB, but somewhat paradoxically, not the most informative in terms of its point of maximum information (a distinction held by Mathematics Knowledge). The reason is that its items span a broad range of abilities, providing standard errors of estimation below .5 (in population standard deviation units) for nearly 90 percent of the youth population. This finding reflects the usefulness in predicting future success in training that accumulated vocabulary has been found to exhibit for a wide range of types of training, over a wide range of abilities. This test, more than any other, attempts to do in paper-and-pencil format what adaptive testing is intended to do, namely, provide reliable measures of aptitude from nearly every subject who will be tested.

Paragraph Comprehension (PC). PC is the shortest test in the ASVAB, consisting of only 15 items. Its maximum information, consequently, is lowest of all eight power tests. It is of interest to note that its point of maximum information is also lowest, about a half standard deviation below the population mean. These results reflect its implicit role in the battery; PC is not intended to provide for fine distinctions among the reading and comprehension abilities across the broad range of the population, but more simply to distinguish those who can read at a minimal level required in the armed services from those who cannot.

Results for one item in PC merit particular attention. Item 15, the last item in the test, stands out from the rest with its uncharacteristically high difficulty, low reliability, and poor model fit. Further investigation revealed that this item appeared on a page of its own, following a page that contained a number of other items for the same reading passage. It can be inferred that this item was inadvertently skipped by a disproportionately

large number of subjects across the range of ability. This finding has important implications for not only the design of paper-and-pencil ASVAB forms (i.e., avoid widowed items) but for converting to computerized adaptive format. In particular, item operating characteristics estimated from paper-and-pencil administration will be inappropriate for the adaptive setting if they have been estimated in a highly context-dependent setting, as is the case for item 15 in the Profiles test administration.

Auto and Shop Information (AS). AS is at the lower end of difficulty of the more technical tests in the ASVAB. Its point of maximum information lies about two-thirds of a standard deviation above the population mean, but the average item threshold in AS is almost exactly at the mean. The test information curve, then, is skewed slightly left. Scores are most precise for individuals a bit above the population mean, but a sufficient number and spread of items of lower difficulties are present to permit reasonably good precision down through about a standard deviation below the mean.

Mathematics Knowledge (MK). Not only is MK the most difficult test in the ASVAB, as indicated by its highest average item threshold value, but it has the highest value of maximum information--this despite having only 25 items as opposed to the 35 of Word Knowledge. The reason is that its items are clustered more tightly with respect to their difficulty, focusing the measurement precision of MK at a point slightly higher than half a standard deviation about the population mean. An examination of content reveals that the items of MK tap skills and concepts generally taught in secondary school math courses such as algebra, geometry, and trigonometry. MK, in short, is useful in determining whether or not a subject is proficient in these areas. MK scores, then, are important mainly for higher-level training courses. Considerably less measurement precision is provided for distinguishing among the proficiency levels of subjects below this level.

Mechanical Comprehension (MC). MC, like MK and EK (see below) is one of the more technical tests of the ASVAB. It has the same number of items as MK (25) and a point of maximum information in a similar region (about three-fourths of a standard deviation above the population mean), but a markedly less peaked information curve. There are two reasons for this result. First, the item thresholds are a bit more disperse. Second, and more importantly, the reliability of its items, as indicated by a comparison of average slope estimates, is not as high. This latter result can be explained in terms of the content of the items. MK items are quite straightforward in the following sense; if one has experience with the concept or definition involved, the item is a simple application of it. One usually either simply knows how to approach the item almost immediately or has no idea how to. MC items, on the other hand, are much more abstract applications of mechanical concepts; solving a MC item correctly requires not only an understanding of the concepts involved, but discerning their application in context and correctly interpreting the schematic diagram about which the question is asked.

Electronics Knowledge (EK). The last of the technical tests, EK exhibits a test information curve spanning a broad range of aptitude, spreading its measurement precision roughly from about one standard deviation below the population mean to two standard deviations above it. Like Word Knowledge, EK functions a bit more like one would expect in an adaptive testing context when reasonably precise measurements are desired over a broad range. With only 20 items, however, bandwidth is achieved at the expense of fidelity. Even at its most informative point, EK provides only slightly more information than the 15-item Paragraph Comprehension test.

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APPENDICES

APPENDIX A

CLASSICAL ITEM STATISTICS

EXHIBIT A-1

CLASSICAL ITEM STATISTICS FOR SUBTEST GENERAL SCIENCE

ITEM	NAME	#TRIED	#RIGHT	PCT	LOGIT/1.7	ITEM*TEST CORRELATION PEARSON	BISERIAL
1	0001	750.1	674.5	0.899	1.29	0.384	0.655
2	0002	750.1	598.8	0.798	0.81	0.398	0.568
3	0003	749.8	590.3	0.787	0.77	0.474	0.668
4	0004	749.4	552.7	0.738	0.61	0.368	0.495
5	0005	749.8	580.7	0.774	0.73	0.384	0.535
6	0006	749.8	618.2	0.825	0.91	0.471	0.693
7	0007	749.8	540.9	0.721	0.56	0.383	0.512
8	0008	749.8	626.7	0.836	0.96	0.298	0.446
9	0009	749.6	584.9	0.780	0.75	0.398	0.557
10	0010	749.8	575.0	0.767	0.70	0.383	0.544
11	0011	749.8	543.4	0.725	0.57	0.430	0.576
12	0012	749.6	390.7	0.521	0.05	0.271	0.340
13	0013	749.8	396.7	0.529	0.07	0.420	0.527
14	0014	749.1	491.7	0.656	0.38	0.359	0.463
15	0015	747.5	529.5	0.708	0.52	0.279	0.389
16	0016	747.1	516.9	0.692	0.47	0.331	0.434
17	0017	744.8	469.2	0.657	0.38	0.305	0.394
18	0018	742.4	326.1	0.439	-0.14	0.437	0.550
19	0019	740.3	367.1	0.496	-0.01	0.314	0.394
20	0020	736.8	384.2	0.521	0.05	0.380	0.477
21	0021	731.5	282.7	0.387	-0.27	0.322	0.410
22	0022	728.8	276.1	0.378	-0.29	0.278	0.355
23	0023	720.2	266.1	0.370	-0.31	0.269	0.344
24	0024	714.1	176.7	0.247	-0.65	0.319	0.436
25	0025	694.4	267.7	0.385	-0.27	0.281	0.358

EXHIBIT A-2

CLASSICAL ITEM STATISTICS FOR SUBTEST ARITHMETIC REASONING

ITEM	NAME	#TRIED	#RIGHT	PCT	LOGIT/1.7	ITEM*TEST CORRELATION PEARSON	BISERIAL
1	0001	749.8	682.1	0.910	1.36	0.185	0.328
2	0002	749.8	687.8	0.917	1.42	0.261	0.464
3	0003	749.5	584.7	0.783	0.66	0.508	0.694
4	0004	749.8	537.2	0.716	0.56	0.543	0.723
5	0005	749.8	479.0	0.639	0.34	0.521	0.688
6	0006	749.8	526.1	0.702	0.50	0.465	0.613
7	0007	749.4	569.4	0.760	0.68	0.284	0.389
8	0008	749.4	541.3	0.722	0.56	0.453	0.605
9	0009	749.6	519.8	0.693	0.48	0.467	0.613
10	0010	749.8	505.9	0.675	0.43	0.520	0.677
11	0011	749.8	466.4	0.622	0.29	0.655	0.838
12	0012	749.7	432.6	0.577	0.18	0.533	0.673
13	0013	749.7	445.7	0.595	0.23	0.443	0.561
14	0014	749.4	428.7	0.572	0.17	0.582	0.734
15	0015	748.2	460.6	0.616	0.28	0.560	0.714
16	0016	747.5	433.8	0.580	0.19	0.409	0.516
17	0017	747.2	382.9	0.512	0.03	0.428	0.537
18	0018	747.2	371.6	0.497	-0.01	0.416	0.522
19	0019	746.6	409.2	0.548	0.11	0.443	0.557
20	0020	745.7	273.7	0.367	-0.32	0.559	0.715
21	0021	744.9	305.5	0.410	-0.21	0.486	0.615
22	0022	742.2	396.2	0.534	0.08	0.505	0.634
23	0023	740.3	381.8	0.516	0.04	0.436	0.547
24	0024	736.8	319.0	0.433	-0.16	0.523	0.659
25	0025	734.5	336.4	0.458	-0.10	0.492	0.618
26	0026	724.7	334.0	0.461	-0.09	0.493	0.619
27	0027	712.3	288.1	0.404	-0.23	0.555	0.703
28	0028	692.5	223.6	0.323	-0.44	0.424	0.583
29	0029	675.5	208.5	0.309	-0.47	0.431	0.565
30	0030	657.6	293.8	0.447	-0.13	0.452	0.568

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EXHIBIT A-3

CLASSICAL ITEM STATISTICS FOR SUBTEST WORD KNOWLEDGE

ITEM	NAME	#TRIED	#RIGHT	PCT	LOGIT/1.7	ITEM*TEST CORRELATION PEARSON	BISERIAL
1	0001	749.8	696.6	0.929	1.51	0.379	0.717
2	0002	749.8	697.9	0.931	1.53	0.378	0.722
3	0003	749.6	670.9	0.895	1.26	0.485	0.817
4	0004	749.8	653.4	0.871	1.13	0.335	0.534
5	0005	749.8	693.2	0.924	1.47	0.389	0.741
6	0006	749.8	645.0	0.860	1.07	0.557	0.869
7	0007	749.6	646.8	0.863	1.08	0.400	0.626
8	0008	749.8	638.0	0.851	1.02	0.565	0.867
9	0009	749.8	519.4	0.693	0.48	0.492	0.646
10	0010	749.2	677.4	0.904	1.32	0.472	0.817
11	0011	748.5	587.3	0.785	0.76	0.556	0.781
12	0012	748.8	628.2	0.839	0.97	0.404	0.608
13	0013	748.6	636.6	0.850	1.02	0.489	0.750
14	0014	748.6	589.0	0.780	0.68	0.531	0.730
15	0015	747.6	586.0	0.784	0.76	0.607	0.852
16	0016	747.3	580.3	0.777	0.73	0.475	0.662
17	0017	745.9	560.4	0.751	0.65	0.609	0.830
18	0018	745.7	579.5	0.777	0.73	0.538	0.760
19	0019	744.1	506.3	0.680	0.44	0.468	0.610
20	0020	743.9	599.3	0.806	0.84	0.574	0.826
21	0021	743.1	571.9	0.770	0.71	0.489	0.650
22	0022	733.7	509.7	0.689	0.47	0.534	0.699
23	0023	736.6	445.7	0.605	0.25	0.540	0.685
24	0024	735.2	421.1	0.573	0.17	0.344	0.434
25	0025	730.8	447.9	0.613	0.27	0.387	0.505
26	0026	725.9	471.6	0.650	0.38	0.548	0.706
27	0027	722.5	437.0	0.605	0.25	0.413	0.525
28	0028	717.6	488.1	0.680	0.44	0.436	0.569
29	0029	712.0	354.8	0.498	-0.00	0.301	0.378
30	0030	700.9	366.5	0.523	0.05	0.362	0.453
31	0031	696.8	598.4	0.859	1.06	0.489	0.760
32	0032	691.4	356.1	0.515	0.04	0.264	0.331
33	0033	684.2	321.0	0.469	-0.07	0.325	0.408
34	0034	678.7	399.7	0.589	0.21	0.457	0.578
35	0035	671.0	373.8	0.557	0.13	0.541	0.681

EXHIBIT A-4

CLASSICAL ITEM STATISTICS FOR SUBTEST PARAGRAPH COMPREHENSION

ITEM	NAME	#TRIED	#RIGHT	PCT	LOGIT/1.7	ITEM*TEST CORRELATION PEARSON	BISERIAL
1	0001	749.6	582.9	0.778	0.74	0.432	0.603
2	0002	749.6	660.7	0.881	1.18	0.370	0.602
3	0003	749.6	621.5	0.829	0.93	0.560	0.830
4	0004	749.4	544.4	0.726	0.57	0.362	0.486
5	0005	748.4	528.3	0.706	0.52	0.531	0.703
6	0006	748.4	539.8	0.721	0.56	0.383	0.512
7	0007	748.4	549.6	0.734	0.60	0.390	0.526
8	0008	748.4	585.2	0.782	0.75	0.328	0.480
9	0009	747.6	560.0	0.749	0.64	0.491	0.669
10	0010	746.9	403.3	0.540	0.09	0.445	0.559
11	0011	742.7	548.6	0.739	0.61	0.274	0.369
12	0012	738.7	443.4	0.600	0.24	0.398	0.504
13	0013	734.5	567.3	0.772	0.72	0.476	0.661
14	0014	720.0	479.7	0.666	0.41	0.387	0.515
15	0015	713.1	346.8	0.486	-0.03	0.066	0.083

EXHIBIT A-5

CLASSICAL ITEM STATISTICS FOR SUBTEST AUTO AND SHOP INFORMATION

ITEM	NAME	#TRIED	#RIGHT	PCT	LOGIT/1.7	ITEM*TEST CORRELATION PEARSON	BISERIAL
1	0001	749.8	585.9	0.785	0.86	0.214	0.293
2	0002	749.8	609.1	0.812	0.86	0.318	0.462
3	0003	749.6	467.5	0.624	0.30	0.467	0.596
4	0004	749.6	626.2	0.834	0.95	0.283	0.422
5	0005	749.8	494.0	0.659	0.39	0.485	0.627
6	0006	749.8	399.1	0.532	0.08	0.554	0.695
7	0007	749.8	378.5	0.505	0.01	0.429	0.538
8	0008	749.8	476.8	0.636	0.33	0.241	0.309
9	0009	748.5	500.1	0.668	0.41	0.192	0.280
10	0010	749.8	454.9	0.607	0.25	0.410	0.521
11	0011	749.8	421.2	0.562	0.15	0.318	0.400
12	0012	749.2	451.0	0.602	0.24	0.281	0.357
13	0013	749.4	450.3	0.601	0.24	0.438	0.556
14	0014	749.2	464.2	0.620	0.29	0.447	0.570
15	0015	748.1	380.0	0.508	0.02	0.445	0.558
16	0016	746.8	383.2	0.513	0.03	0.482	0.604
17	0017	744.9	304.9	0.409	-0.22	0.497	0.628
18	0018	742.4	308.5	0.416	-0.20	0.478	0.604
19	0019	741.6	486.4	0.656	0.38	0.322	0.415
20	0020	736.1	379.0	0.515	0.03	0.377	0.472
21	0021	730.1	303.7	0.416	-0.20	0.313	0.395
22	0022	727.3	301.3	0.414	-0.20	0.484	0.586
23	0023	721.8	222.4	0.308	-0.48	0.584	0.765
24	0024	712.2	212.8	0.299	-0.50	0.375	0.485
25	0025	704.9	293.2	0.416	-0.20	0.248	0.314

EXHIBIT A-6

CLASSICAL ITEM STATISTICS FOR SUBTEST MATHEMATICS KNOWLEDGE

ITEM	NAME	#TRIED	#RIGHT	PCT	LOGIT/1.7	ITEM*TEST CORRELATION PEARSON	BISERIAL
1	0001	749.3	645.2	0.861	1.07	0.380	0.562
2	0002	749.3	580.7	0.775	0.73	0.343	0.478
3	0003	749.3	446.3	0.596	0.23	0.498	0.631
4	0004	749.0	521.8	0.697	0.49	0.455	0.598
5	0005	749.3	551.6	0.736	0.80	0.303	0.408
6	0006	748.9	421.8	0.563	0.15	0.548	0.691
7	0007	748.7	480.6	0.642	0.34	0.490	0.629
8	0008	748.9	427.6	0.571	0.17	0.428	0.539
9	0009	748.9	493.3	0.659	0.39	0.493	0.585
10	0010	748.7	447.6	0.598	0.23	0.434	0.550
11	0011	748.4	406.4	0.543	0.10	0.380	0.438
12	0012	747.5	347.3	0.465	-0.08	0.562	0.705
13	0013	747.3	390.4	0.522	0.05	0.607	0.761
14	0014	746.1	321.8	0.431	-0.16	0.581	0.744
15	0015	745.4	298.9	0.401	-0.24	0.308	0.391
16	0016	744.8	394.5	0.530	0.07	0.498	0.624
17	0017	744.0	308.7	0.415	-0.20	0.582	0.749
18	0018	744.0	355.8	0.478	-0.05	0.569	0.713
19	0019	743.8	406.9	0.547	0.11	0.422	0.530
20	0020	742.0	343.7	0.463	-0.09	0.405	0.508
21	0021	741.1	301.4	0.407	-0.22	0.362	0.458
22	0022	739.1	249.7	0.338	-0.40	0.500	0.647
23	0023	735.8	217.1	0.295	-0.51	0.506	0.669
24	0024	735.7	215.5	0.297	-0.51	0.401	0.529
25	0025	706.3	228.6	0.324	-0.43	0.498	0.646

EXHIBIT A-7

CLASSICAL ITEM STATISTICS FOR SUBTEST MECHANICAL REASONING

ITEM	NAME	#TRIED	#RIGHT	PCT	LOGIT/1.7	ITEM*TEST CORRELATION PEARSON	BISERIAL
1	0001	749.5	657.8	0.878	1.16	0.232	0.375
2	0002	749.1	578.0	0.772	0.72	0.407	0.564
3	0003	749.5	586.6	0.783	0.75	0.320	0.449
4	0004	749.5	306.5	0.409	-0.22	0.370	0.468
5	0005	749.5	427.8	0.571	0.17	0.427	0.538
6	0006	749.3	447.0	0.597	0.23	0.239	0.303
7	0007	749.3	434.1	0.579	0.19	0.387	0.489
8	0008	749.0	474.4	0.633	0.32	0.507	0.649
9	0009	749.0	499.2	0.666	0.41	0.315	0.409
10	0010	747.7	440.3	0.589	0.21	0.545	0.689
11	0011	749.3	497.3	0.664	0.40	0.257	0.333
12	0012	749.3	428.9	0.572	0.17	0.478	0.603
13	0013	749.0	480.8	0.642	0.34	0.437	0.561
14	0014	748.0	428.5	0.573	0.17	0.483	0.584
15	0015	748.2	419.5	0.561	0.14	0.447	0.562
16	0016	746.6	436.7	0.585	0.20	0.326	0.412
17	0017	746.1	377.0	0.506	0.01	0.339	0.425
18	0018	743.6	369.5	0.497	-0.01	0.406	0.512
19	0019	741.6	314.6	0.424	-0.18	0.201	0.253
20	0020	736.9	383.4	0.520	0.06	0.377	0.472
21	0021	734.1	325.5	0.443	-0.13	0.382	0.483
22	0022	727.0	286.8	0.395	-0.25	0.251	0.319
23	0023	716.5	262.7	0.367	-0.32	0.483	0.592
24	0024	707.6	302.2	0.427	-0.17	0.374	0.472
25	0025	697.3	264.2	0.379	-0.29	0.440	0.561

EXHIBIT A-8

CLASSICAL ITEM STATISTICS FOR SUBTEST ELECTRONICS KNOWLEDGE

ITEM	NAME	#TRIED	#RIGHT	PCT	LOGIT/1.7	ITEM*TEST CORRELATION PEARSON	BISERIAL
1	0001	749.8	598.2	0.798	0.81	0.349	0.487
2	0002	749.8	538.1	0.718	0.55	0.414	0.551
3	0003	749.8	518.6	0.692	0.48	0.480	0.630
4	0004	749.8	520.3	0.694	0.48	0.474	0.622
5	0005	748.6	570.5	0.762	0.68	0.355	0.489
6	0006	749.8	488.2	0.652	0.37	0.486	0.[illegible]
7	0007	749.6	501.2	0.669	0.41	0.420	0.548
8	0008	748.2	487.6	0.652	0.37	0.401	0.517
9	0009	747.6	517.7	0.692	0.48	0.301	0.395
10	0010	747.6	409.9	0.548	0.11	0.440	0.553
11	0011	747.0	338.3	0.453	-0.11	0.273	0.343
12	0012	746.8	352.6	0.472	-0.07	0.451	0.566
13	0013	744.8	317.4	0.426	-0.18	0.416	0.524
14	0014	743.9	378.9	0.511	0.03	0.213	0.267
15	0015	741.2	325.2	0.439	-0.14	0.457	0.575
16	0016	738.9	321.2	0.435	-0.15	0.363	0.458
17	0017	735.0	199.6	0.272	-0.58	0.073	0.087
18	0018	733.0	316.6	0.432	-0.16	0.374	0.471
19	0019	727.2	327.8	0.451	-0.12	0.376	0.472
20	0020	720.3	226.6	0.315	-0.46	0.343	0.449

APPENDIX B

ITEM PARAMETER ESTIMATES, 1-PARAMETER LOGISTIC MODEL

EXHIBIT B-1

ITEM PARAMETER ESTIMATES FOR GENERAL SCIENCE; 1-PARAMETER LOGISTIC MODEL

ITEM	INTERCEPT	S.E.	SLOPE	S.E.	THRESHOLD	S.E.	DISPERSN	S.E.	ASYMPTOTE	S.E.	CHISQ	DF	PROB
0001	1.527	0.080	0.854	0.014	-2.336	0.123	1.530	0.033	0.0	0.0	21.3	9.0	0.0115
0002	0.966	0.060	0.854	0.014	-1.508	0.093	1.530	0.033	0.0	0.0	18.4	9.0	0.0312
0003	0.940	0.061	0.854	0.014	-1.437	0.094	1.530	0.033	0.0	0.0	38.2	9.0	0.0000
0004	0.749	0.054	0.854	0.014	-1.146	0.083	1.530	0.033	0.0	0.0	10.8	9.0	0.2869
0005	0.888	0.058	0.854	0.014	-1.359	0.089	1.530	0.033	0.0	0.0	12.9	9.0	0.1661
0006	1.102	0.066	0.854	0.014	-1.686	0.101	1.530	0.033	0.0	0.0	40.1	9.0	0.0000
0007	0.693	0.054	0.854	0.014	-1.059	0.082	1.530	0.033	0.0	0.0	13.6	9.0	0.1382
0008	1.156	0.063	0.854	0.014	-1.768	0.097	1.530	0.033	0.0	0.0	8.6	9.0	0.4803
0009	0.911	0.059	0.854	0.014	-1.393	0.090	1.530	0.033	0.0	0.0	17.0	9.0	0.0491
0010	0.859	0.057	0.854	0.014	-1.314	0.088	1.530	0.033	0.0	0.0	10.2	9.0	0.3331
0011	0.704	0.055	0.854	0.014	-1.077	0.084	1.530	0.033	0.0	0.0	18.1	9.0	0.0336
0012	0.076	0.046	0.854	0.014	-0.116	0.071	1.530	0.033	0.0	0.0	30.1	9.0	0.0005
0013	0.089	0.050	0.854	0.014	-0.151	0.078	1.530	0.033	0.0	0.0	18.9	9.0	0.0261
0014	0.477	0.050	0.854	0.014	-0.730	0.077	1.530	0.033	0.0	0.0	2.1	9.0	0.9883
0015	0.644	0.051	0.854	0.014	-0.985	0.078	1.530	0.033	0.0	0.0	10.1	9.0	0.3450
0016	0.587	0.051	0.854	0.014	-0.899	0.079	1.530	0.033	0.0	0.0	24.7	9.0	0.0035
0017	0.475	0.049	0.854	0.014	-0.727	0.075	1.530	0.033	0.0	0.0	9.0	9.0	0.4370
0018	-0.168	0.051	0.854	0.014	0.257	0.078	1.530	0.033	0.0	0.0	35.3	9.0	0.0001
0019	-0.005	0.048	0.854	0.014	0.008	0.073	1.530	0.033	0.0	0.0	16.1	9.0	0.0644
0020	0.065	0.049	0.854	0.014	-0.100	0.075	1.530	0.033	0.0	0.0	6.6	9.0	0.6807
0021	-0.333	0.050	0.854	0.014	0.510	0.076	1.530	0.033	0.0	0.0	12.8	9.0	0.1682
0022	-0.360	0.049	0.854	0.014	0.551	0.075	1.530	0.033	0.0	0.0	13.9	9.0	0.1258
0023	-0.393	0.049	0.854	0.014	0.602	0.075	1.530	0.033	0.0	0.0	19.2	9.0	0.0237
0024	-0.816	0.059	0.854	0.014	1.249	0.090	1.530	0.033	0.0	0.0	34.6	9.0	0.0001
0025	-0.359	0.051	0.854	0.014	0.549	0.078	1.530	0.033	0.0	0.0	34.2	9.0	0.0001
											476.6	225.0	0.0000

PARAMETER	MEAN	STN DEV
THRESHOLD	-0.843	0.919

QUADRATURE POINTS AND POSTERIOR WEIGHTS:

	1	2	3	4	5	6	7	8	9	10
POINT	-0.3871D+01	-0.3088D+01	-0.2208D+01	-0.1323D+01	-0.4400D+00	0.4428D+00	0.1326D+01	0.2208D+01	0.3091D+01	0.3974D+01
WEIGHT	0.8672D-06	0.9714D-03	0.2670D-01	0.1304D+00	0.3731D+00	0.3268D+00	0.8471D-01	0.4312D-01	0.1322D-01	0.9927D-03

EXHIBIT B-2

ITEM PARAMETER ESTIMATES FOR ARITHMETIC REASONING; 1-PARAMETER LOGISTIC MODEL

ITEM	INTERCEPT	S.E.	SLOPE	S.E.	THRESHOLD	S.E.	DISPERSN	S.E.	ASYMPTOTE	S.E.	CHISQ	DF	PROB
0001	1.738	0.077	0.860	0.013	-2.021	0.090	1.163	0.018	0.0	0.0	12.6	9.0	0.1818
0002	1.801	0.082	0.860	0.013	-2.094	0.096	1.163	0.018	0.0	0.0	11.6	9.0	0.2354
0003	0.922	0.060	0.860	0.013	-1.072	0.070	1.163	0.018	0.0	0.0	38.0	9.0	0.0000
0004	0.782	0.058	0.860	0.013	-0.910	0.068	1.163	0.018	0.0	0.0	52.6	9.0	0.0000
0005	0.511	0.054	0.860	0.013	-0.595	0.063	1.163	0.018	0.0	0.0	13.4	9.0	0.1441
0006	0.729	0.055	0.860	0.013	-0.848	0.064	1.163	0.018	0.0	0.0	15.1	9.0	0.0870
0007	0.947	0.063	0.860	0.013	-1.101	0.082	1.163	0.018	0.0	0.0	18.1	9.0	0.0335
0008	0.803	0.055	0.860	0.013	-0.934	0.064	1.163	0.018	0.0	0.0	15.3	9.0	0.0832
0009	0.699	0.056	0.860	0.013	-0.813	0.064	1.163	0.018	0.0	0.0	15.4	9.0	0.0801
0010	0.634	0.055	0.860	0.013	-0.737	0.064	1.163	0.018	0.0	0.0	18.6	9.0	0.0284
0011	0.455	0.058	0.860	0.013	-0.529	0.068	1.163	0.018	0.0	0.0	76.8	9.0	0.0000
0012	0.307	0.053	0.860	0.013	-0.357	0.061	1.163	0.018	0.0	0.0	11.3	9.0	0.2523
0013	0.364	0.060	0.860	0.013	-0.424	0.058	1.163	0.018	0.0	0.0	4.7	9.0	0.8628
0014	0.290	0.054	0.860	0.013	-0.338	0.063	1.163	0.018	0.0	0.0	22.0	9.0	0.0090
0015	0.432	0.055	0.860	0.013	-0.502	0.063	1.163	0.018	0.0	0.0	18.5	9.0	0.0300
0016	0.315	0.049	0.860	0.013	-0.367	0.057	1.163	0.018	0.0	0.0	13.8	9.0	0.1278
0017	0.094	0.048	0.860	0.013	-0.109	0.057	1.163	0.018	0.0	0.0	28.5	9.0	0.0026
0018	0.044	0.048	0.860	0.013	-0.052	0.057	1.163	0.018	0.0	0.0	35.9	9.0	0.0001
0019	0.209	0.049	0.860	0.013	-0.243	0.057	1.163	0.018	0.0	0.0	16.3	9.0	0.0597
0020	-0.403	0.056	0.860	0.013	0.469	0.065	1.163	0.018	0.0	0.0	13.8	9.0	0.1282
0021	-0.250	0.053	0.860	0.013	0.291	0.061	1.163	0.018	0.0	0.0	10.1	9.0	0.3413
0022	0.161	0.052	0.860	0.013	-0.188	0.060	1.163	0.018	0.0	0.0	9.5	9.0	0.3959
0023	0.101	0.050	0.860	0.013	-0.117	0.058	1.163	0.018	0.0	0.0	14.0	9.0	0.1208
0024	-0.173	0.054	0.860	0.013	0.201	0.063	1.163	0.018	0.0	0.0	37.8	9.0	0.0000
0025	-0.088	0.052	0.860	0.013	0.103	0.060	1.163	0.018	0.0	0.0	11.9	9.0	0.2195
0026	-0.082	0.052	0.860	0.013	0.095	0.061	1.163	0.018	0.0	0.0	[illegible]	9.0	0.9219
0027	-0.279	0.056	0.860	0.013	0.324	0.065	1.163	0.018	0.0	0.0	10.3	9.0	0.3283
0028	-0.576	0.066	0.860	0.013	0.670	0.065	1.163	0.018	0.0	0.0	21.5	9.0	0.0105
0029	-0.622	0.058	0.860	0.013	0.724	0.067	1.163	0.018	0.0	0.0	10.7	9.0	0.2995
0030	-0.118	0.054	0.860	0.013	0.137	0.062	1.163	0.018	0.0	0.0	15.5	9.0	0.0772
											594.6	270.0	0.0000

PARAMETER	MEAN	STN DEV
THRESHOLD	-0.378	0.675

QUADRATURE POINTS AND POSTERIOR WEIGHTS:

	1	2	3	4	5	6	7	8	9	10
POINT	-0.3769D+01	-0.2932D+01	-0.2095D+01	-0.1258D+01	-0.4203D+00	0.4169D+00	0.1254D+01	0.2091D+01	0.2929D+01	0.3766D+01
WEIGHT	0.1347D-06	0.4789D-04	0.1057D-02	0.2064D+00	0.3750D+00	0.2065D+00	0.1377D+00	0.6003D-01	0.1343D-01	0.8059D-03

EXHIBIT B-3

ITEM PARAMETER ESTIMATES FOR WORD KNOWLEDGE; 1-PARAMETER LOGISTIC MODEL

ITEM	INTERCEPT	S.E.	SLOPE	S.E.	THRESHOLD	S.E.	DISPERSN	S.E.	ASYMPTOTE	S.E.	CHISQ	DF	PROB
0001	2.003	0.095	0.878	0.012	-2.282	0.108	1.139	0.015	0.0	0.0	11.9	9.0	0.2211
0002	2.022	0.097	0.878	0.012	-2.303	0.110	1.139	0.015	0.0	0.0	13.3	9.0	0.1483
0003	1.699	0.084	0.878	0.012	-1.936	0.096	1.139	0.015	0.0	0.0	25.1	9.0	0.0030
0004	1.533	0.070	0.878	0.012	-1.746	0.080	1.139	0.015	0.0	0.0	8.7	9.0	0.3790
0005	1.956	0.094	0.878	0.012	-2.229	0.107	1.139	0.015	0.0	0.0	20.1	9.0	0.0175
0006	1.461	0.078	0.878	0.012	-1.664	0.088	1.139	0.015	0.0	0.0	30.5	9.0	0.0004
0007	1.476	0.070	0.878	0.012	-1.681	0.080	1.139	0.015	0.0	0.0	8.4	9.0	0.4975
0008	1.404	0.077	0.878	0.012	-1.600	0.087	1.139	0.015	0.0	0.0	35.6	9.0	0.0001
0009	0.673	0.055	0.878	0.012	-0.766	0.063	1.139	0.015	0.0	0.0	6.4	9.0	0.7046
0010	1.770	0.088	0.878	0.012	-2.016	0.100	1.139	0.015	0.0	0.0	31.1	9.0	0.0003
0011	1.055	0.065	0.878	0.012	-1.202	0.075	1.139	0.015	0.0	0.0	18.8	9.0	0.0267
0012	1.331	0.066	0.878	0.012	-1.517	0.076	1.139	0.015	0.0	0.0	11.5	9.0	0.2428
0013	1.396	0.072	0.878	0.012	-1.591	0.082	1.139	0.015	0.0	0.0	9.3	9.0	0.4118
0014	0.944	0.061	0.878	0.012	-1.076	0.070	1.139	0.015	0.0	0.0	9.3	9.0	0.4072
0015	1.047	0.068	0.878	0.012	-1.193	0.077	1.139	0.015	0.0	0.0	36.2	9.0	0.0000
0016	1.013	0.061	0.878	0.012	-1.155	0.069	1.139	0.015	0.0	0.0	10.0	9.0	0.3510
0017	0.899	0.065	0.878	0.012	-1.025	0.074	1.139	0.015	0.0	0.0	33.8	9.0	0.0001
0018	1.011	0.064	0.878	0.012	-1.152	0.073	1.139	0.015	0.0	0.0	20.4	9.0	0.0155
0019	0.612	0.054	0.878	0.012	-0.697	0.062	1.139	0.015	0.0	0.0	8.2	9.0	0.5183
0020	1.142	0.069	0.878	0.012	-1.301	0.078	1.139	0.015	0.0	0.0	18.8	9.0	0.0267
0021	0.972	.060	0.878	0.012	-1.107	0.068	1.139	0.015	0.0	0.0	[illegible]	9.0	0.1150
0022	0.635	0.[illegible]57	0.878	0.012	-0.723	0.065	1.139	0.015	0.0	0.0	31.3	9.0	0.0003
0023	0.329	0.0[illegible]	0.878	0.012	-0.375	0.064	1.139	0.015	0.0	0.0	28.5	9.0	0.0009
0024	0.214	0.048	0.878	0.012	-0.244	0.055	1.139	0.015	0.0	0.0	45.7	9.0	0.0000
0025	0.344	0.050	0.878	0.012	-0.392	0.057	1.139	0.015	0.0	0.0	28.7	9.0	0.0008
0026	0.463	0.057	0.878	0.012	-0.527	0.065	1.139	0.015	0.0	0.0	25.0	9.0	0.0031
0027	0.300	0.051	0.878	0.012	-0.342	0.058	1.139	0.015	0.0	0.0	14.7	9.0	0.0976
0028	0.561	0.054	0.878	0.012	-0.639	0.061	1.139	0.015	0.0	0.0	17.3	9.0	0.0438
0029	-0.068	0.048	0.878	0.012	0.077	0.055	1.139	0.015	0.0	0.0	47.3	9.0	0.0000
0030	-0.002	0.050	0.878	0.012	0.002	0.057	1.139	0.015	0.0	0.0	24.7	9.0	0.0034
0031	1.333	0.075	0.878	0.012	-1.518	0.086	1.139	0.015	0.0	0.0	13.7	9.0	0.1318
0032	-0.043	0.048	0.878	0.012	0.049	0.054	1.139	0.015	0.0	0.0	57.4	9.0	0.0000
0033	-0.199	0.051	0.878	0.012	0.227	0.058	1.139	0.015	0.0	0.0	62.0	9.0	0.0000
0034	0.182	0.054	0.878	0.012	-0.207	0.061	1.139	0.015	0.0	0.0	11.0	9.0	0.2733
0035	0.067	0.058	0.878	0.012	-0.077	0.066	1.139	0.015	0.0	0.0	26.0	9.0	0.0021
											815.8	315.0	0.0000

PARAMETER	MEAN	STN DEV
THRESHOLD	-1.026	0.733

QUADRATURE POINTS AND POSTERIOR WEIGHTS:

	1	2	3	4	5	6	7	8	9	10
POINT	-0.3931D+01	-0.3060D+01	-0.2188D+01	-0.1316D+01	-0.4445D+00	0.4272D+00	0.1299D+01	0.2171D+01	0.3042D+01	0.3914D+01
WEIGHT	0.2673D-06	0.4050D-03	0.3708D-01	0.1591D+00	0.2861D+00	0.3266D+00	0.1501D+00	0.3653D-01	0.3654D-02	0.1573D-03

EXHIBIT B-4

ITEM PARAMETER ESTIMATES FOR PARAGRAPH COMPREHENSION; 1-PARAMETER LOGISTIC MODEL

ITEM	INTERCEPT	S.E.	SLOPE	S.E.	THRESHOLD	S.E.	DISPERSN	S.E.	ASYMPTOTE	S.E.	CHISQ	DF	PROB
0001	0.926	0.060	0.680	0.017	-1.361	0.088	1.470	0.037	0.0	0.0	10.7	7.0	0.1513
0002	1.461	0.075	0.680	0.017	-2.148	0.110	1.470	0.037	0.0	0.0	15.1	7.0	0.0349
0003	1.163	0.071	0.680	0.017	-1.709	0.104	1.470	0.037	0.0	0.0	62.5	7.0	0.0000
0004	0.722	0.055	0.680	0.017	-1.061	0.081	1.470	0.037	0.0	0.0	9.4	7.0	0.2224
0005	0.645	0.059	0.680	0.017	-0.948	0.086	1.470	0.037	0.0	0.0	28.6	7.0	0.0002
0006	0.702	0.055	0.680	0.017	-1.031	0.080	1.470	0.037	0.0	0.0	10.1	7.0	0.1819
0007	0.751	0.056	0.680	0.017	-1.104	0.082	1.470	0.037	0.0	0.0	2.0	7.0	0.9567
0008	0.943	0.058	0.680	0.017	-1.386	0.085	1.470	0.037	0.0	0.0	11.2	7.0	0.1272
0009	0.807	0.060	0.680	0.017	-1.187	0.088	1.470	0.037	0.0	0.0	17.7	7.0	0.0133
0010	0.105	0.052	0.680	0.017	-0.154	0.076	1.470	0.037	0.0	0.0	21.6	7.0	0.0031
0011	0.763	0.053	0.680	0.017	-1.122	0.078	1.470	0.037	0.0	0.0	18.4	7.0	0.0102
0012	0.284	0.051	0.680	0.017	-0.417	0.076	1.470	0.037	0.0	0.0	7.5	7.0	0.3833
0013	0.889	0.062	0.680	0.017	-1.306	0.091	1.470	0.037	0.0	0.0	12.0	7.0	0.1003
0014	0.486	0.054	0.680	0.017	-0.714	0.079	1.470	0.037	0.0	0.0	11.8	7.0	0.1065
0015	-0.081	0.044	0.680	0.017	0.119	0.065	1.470	0.037	0.0	0.0	108.3	7.0	0.0000
											347.1	105.0	0.0000

PARAMETER	MEAN	STN DEV
THRESHOLD	-1.035	0.575

QUADRATURE POINTS AND POSTERIOR WEIGHTS:

	1	2	3	4	5	6	7	8	9	10
POINT	-0.4013D+01	-0.3122D+01	-0.2231D+01	-0.1340D+01	-0.4497D+00	0.4411D+00	0.1332D+01	0.2223D+01	0.3113D+01	0.4004D+01
WEIGHT	0.4001D-04	0.9865D-03	0.3735D-01	0.1684D+00	0.2247D+00	0.4042D+00	0.1445D+00	0.1839D-01	0.1307D-02	0.4941D-04

EXHIBIT B-5

ITEM PARAMETER ESTIMATES FOR AUTO AND SHOP INFORMATION; 1-PARAMETER LOGISTIC MODEL

ITEM	INTERCEPT	S.E.	SLOPE	S.E.	THRESHOLD	S.E.	DISPERSN	S.E.	ASYMPTOTE	S.E.	CHISQ	DF	PROB
0001	0.831	0.052	0.673	0.014	-1.235	0.077	1.486	0.031	0.0	0.0	16.5	9.0	0.0570
0002	1.060	0.060	0.673	0.014	-1.575	0.088	1.486	0.031	0.0	0.0	7.4	9.0	0.5995
0003	0.401	0.052	0.673	0.014	-0.596	0.077	1.486	0.031	0.0	0.0	19.7	9.0	0.0197
0004	1.158	0.062	0.673	0.014	-1.720	0.092	1.486	0.031	0.0	0.0	7.0	9.0	0.6335
0005	0.510	0.053	0.673	0.014	-0.757	0.079	1.486	0.031	0.0	0.0	46.7	9.0	0.0000
0006	0.131	0.053	0.673	0.014	-0.194	0.078	1.486	0.031	0.0	0.0	55.8	9.0	0.0000
0007	0.050	0.050	0.673	0.014	-0.074	0.074	1.486	0.031	0.0	0.0	12.1	9.0	0.2043
0008	0.439	0.047	0.673	0.014	-0.652	0.070	1.486	0.031	0.0	0.0	28.3	9.0	0.0009
0009	0.538	0.047	0.673	0.014	-0.799	0.070	1.486	0.031	0.0	0.0	46.0	9.0	0.0000
0010	0.350	0.050	0.673	0.014	-0.520	0.074	1.486	0.031	0.0	0.0	4.9	9.0	0.8459
0011	0.217	0.047	0.673	0.014	-0.323	0.070	1.486	0.031	0.0	0.0	11.5	9.0	0.2402
0012	0.336	0.047	0.673	0.014	-0.499	0.070	1.486	0.031	0.0	0.0	24.1	9.0	0.0042
0013	0.332	0.050	0.673	0.014	-0.494	0.075	1.486	0.031	0.0	0.0	22.8	9.0	0.0068
0014	0.389	0.051	0.673	0.014	-0.577	0.076	1.486	0.031	0.0	0.0	21.1	9.0	0.0123
0015	0.058	0.050	0.673	0.014	-0.086	0.074	1.486	0.031	0.0	0.0	7.3	9.0	0.5105
0016	0.072	0.051	0.673	0.014	-0.108	0.076	1.486	0.031	0.0	0.0	17.3	9.0	0.0433
0017	-0.241	0.053	0.673	0.014	0.359	0.079	1.486	0.031	0.0	0.0	33.2	9.0	0.0001
0018	-0.224	0.052	0.673	0.014	0.333	0.078	1.486	0.031	0.0	0.0	27.8	9.0	0.0011
0019	0.493	0.050	0.673	0.014	-0.733	0.074	1.486	0.031	0.0	0.0	20.5	9.0	0.0153
0020	0.067	0.048	0.673	0.014	-0.100	0.072	1.486	0.031	0.0	0.0	20.5	9.0	0.0151
0021	-0.230	0.048	0.673	0.014	0.341	0.072	1.486	0.031	0.0	0.0	19.8	9.0	0.0195
0022	-0.237	0.053	0.673	0.014	0.352	0.078	1.486	0.031	0.0	0.0	28.9	9.0	0.0007
0023	-0.591	0.061	0.673	0.014	0.878	0.091	1.486	0.031	0.0	0.0	47.3	9.0	0.0000
0024	-0.630	0.055	0.673	0.014	0.935	0.082	1.486	0.031	0.0	0.0	18.6	9.0	0.0288
0025	-0.246	0.047	0.673	0.014	0.364	0.070	1.486	0.031	0.0	0.0	33.9	9.0	0.0001
											599.1	225.0	0.0000

PARAMETER	MEAN	STN DEV
THRESHOLD	-0.299	0.670

QUADRATURE POINTS AND POSTERIOR WEIGHTS:

	1	2	3	4	5	6	7	8	9	10
POINT	-0.3948D+01	-0.3088D+01	-0.2192D+01	-0.1315D+01	-0.4388D+00	0.4378D+00	0.1314D+01	0.2191D+01	0.3068D+01	0.3944D+01
WEIGHT	0.3817D-08	0.4781D-05	0.2274D-02	0.1626D+00	0.4435D+00	0.3074D+00	0.1087D+00	0.6700D-01	0.8257D-02	0.3260D-03

EXHIBIT B-6

ITEM PARAMETER ESTIMATES FOR MATHEMATICS KNOWLEDGE; 1-PARAMETER LOGISTIC MODEL

ITEM	INTERCEPT	S.E.	SLOPE	S.E.	THRESHOLD	S.E.	DISPERSN	S.E.	ASYMPTOTE	S.E.	CHISQ	DF	PROB
0001	1.386	0.069	0.830	0.015	-1.670	0.083	1.205	0.022	0.0	0.0	34.4	9.0	0.0001
0002	0.988	0.057	0.830	0.015	-1.187	0.068	1.205	0.022	0.0	0.0	4.7	9.0	0.8637
0003	0.365	0.052	0.830	0.015	-0.439	0.063	1.205	0.022	0.0	0.0	22.4	9.0	0.0077
0004	0.695	0.054	0.830	0.015	-0.838	0.065	1.205	0.022	0.0	0.0	20.5	9.0	0.0152
0005	0.836	0.053	0.830	0.015	-1.007	0.064	1.205	0.022	0.0	0.0	15.9	9.0	0.0691
0006	0.262	0.053	0.830	0.015	-0.316	0.064	1.205	0.022	0.0	0.0	20.9	9.0	0.0133
0007	0.512	0.053	0.830	0.015	-0.617	0.064	1.205	0.022	0.0	0.0	24.9	9.0	0.0032
0008	0.287	0.049	0.830	0.015	-0.345	0.060	1.205	0.022	0.0	0.0	15.2	9.0	0.0849
0009	0.527	0.052	0.830	0.015	-0.683	0.063	1.205	0.022	0.0	0.0	9.2	9.0	0.4190
0010	0.371	0.050	0.830	0.015	-0.447	0.060	1.205	0.022	0.0	0.0	11.4	9.0	0.2469
0011	0.198	0.047	0.830	0.015	-0.238	0.057	1.205	0.022	0.0	0.0	19.6	9.0	0.0204
0012	-0.051	0.054	0.830	0.015	0.062	0.065	1.205	0.022	0.0	0.0	18.5	9.0	0.0299
0013	0.133	0.055	0.830	0.015	-0.160	0.066	1.205	0.022	0.0	0.0	65.7	9.0	0.0000
0014	-0.162	0.056	0.830	0.015	0.195	0.067	1.205	0.022	0.0	0.0	26.3	9.0	0.0019
0015	-0.265	0.047	0.830	0.015	0.319	0.057	1.205	0.022	0.0	0.0	45.4	9.0	0.0000
0016	0.153	0.052	0.830	0.015	-0.185	0.062	1.205	0.022	0.0	0.0	21.0	9.0	0.0128
0017	-0.218	0.056	0.830	0.015	0.263	0.067	1.205	0.022	0.0	0.0	21.0	9.0	0.0130
0018	-0.010	0.054	0.830	0.015	0.012	0.065	1.205	0.022	0.0	0.0	41.4	9.0	0.0000
0019	0.207	0.050	0.830	0.015	-0.250	0.060	1.205	0.022	0.0	0.0	18.1	9.0	0.0341
0020	-0.060	0.049	0.830	0.015	0.073	0.059	1.205	0.022	0.0	0.0	20.8	9.0	0.0135
0021	-0.248	0.049	0.830	0.015	0.299	0.059	1.205	0.022	0.0	0.0	30.8	9.0	0.0004
0022	-0.495	0.057	0.830	0.015	0.596	0.068	1.205	0.022	0.0	0.0	28.1	9.0	0.0010
0023	-0.662	0.060	0.830	0.015	0.798	0.072	1.205	0.022	0.0	0.0	21.5	9.0	0.0107
0024	-0.660	0.054	0.830	0.015	0.795	0.065	1.205	0.022	0.0	0.0	21.3	9.0	0.0117
0025	-0.565	0.068	0.830	0.015	0.681	0.070	1.205	0.022	0.0	0.0	13.1	9.0	0.1566
											592.2	225.0	0.0000

PARAMETER	MEAN	STN DEV
THRESHOLD	-0.172	0.619

QUADRATURE POINTS AND POSTERIOR WEIGHTS:

	1	2	3	4	5	6	7	8	9	10
POINT	-0.3948D+01	-0.3078D+01	-0.2210D+01	-0.1341D+01	-0.4733D+00	0.3948D+00	0.1263D+01	0.2131D+01	0.2999D+01	0.3867D+01
WEIGHT	0.7734D-08	0.1710D-05	0.4297D-03	0.1336D+00	0.4547D+00	0.2175D+00	0.1110D+00	0.7038D-01	0.1178D-01	0.8253D-03

EXHIBIT B-7

ITEM PARAMETER ESTIMATES FOR MECHANICAL REASONING; 1-PARAMETER LOGISTIC MODEL

ITEM	INTERCEPT	S.E.	SLOPE	S.E.	THRESHOLD	S.E.	DISPERSN	S.E.	ASYMPTOTE	S.E.	CHISQ	DF	PROB
0001	1.377	0.069	0.624	0.013	-2.208	0.110	1.604	0.034	0.0	0.0	4.2	9.0	0.9013
0002	0.877	0.058	0.624	0.013	-1.406	0.092	1.604	0.034	0.0	0.0	22.9	9.0	0.0065
0003	0.921	0.057	0.624	0.013	-1.477	0.091	1.604	0.034	0.0	0.0	4.6	9.0	.8674
0004	-0.253	0.049	0.624	0.013	0.405	0.079	1.604	0.034	0.0	0.0	7.1	9.0	0.6322
0005	0.223	0.050	0.624	0.013	-0.358	0.080	1.604	0.034	0.0	0.0	13.7	9.0	0.1341
0006	0.299	0.046	0.624	0.013	-0.479	0.074	1.604	0.034	0.0	0.0	28.0	9.0	0.0010
0007	0.248	0.049	0.624	0.013	-0.398	0.079	1.604	0.034	0.0	0.0	14.8	9.0	0.0972
0008	0.410	0.053	0.624	0.013	-0.657	0.085	1.604	0.034	0.0	0.0	48.5	9.0	0.0000
0009	0.513	0.050	0.624	0.013	-0.822	0.080	1.604	0.034	0.0	0.0	15.6	9.0	0.0749
0010	0.276	0.053	0.624	0.013	-0.442	0.085	1.604	0.034	0.0	0.0	59.9	9.0	0.0000
0011	0.504	0.048	0.624	0.013	-0.809	0.078	1.604	0.034	0.0	0.0	12.4	9.0	0.1888
0012	0.228	0.051	0.624	0.013	-0.365	0.082	1.604	0.034	0.0	0.0	26.7	9.0	0.0017
0013	0.436	0.051	0.624	0.013	-0.699	0.082	1.604	0.034	0.0	0.0	22.7	9.0	0.0071
0014	0.229	0.051	0.624	0.013	-0.367	0.081	1.604	0.034	0.0	0.0	17.6	9.0	0.0397
0015	0.193	0.050	0.624	0.013	-0.310	0.080	1.604	0.034	0.0	0.0	25.5	9.0	0.0026
0016	0.264	0.048	0.624	0.013	-0.424	0.077	1.604	0.034	0.0	0.0	16.3	9.0	0.0607
0017	0.031	0.048	0.624	0.013	-0.050	0.076	1.604	0.034	0.0	0.0	12.5	9.0	0.1883
0018	0.004	0.049	0.624	0.013	-0.007	0.079	1.604	0.034	0.0	0.0	17.0	9.0	0.0481
0019	-0.211	0.045	0.624	0.013	0.338	0.073	1.604	0.034	0.0	0.0	54.6	9.0	0.0000
0020	0.070	0.048	0.624	0.013	-0.112	0.078	1.604	0.034	0.0	0.0	8.4	9.0	0.4963
0021	-0.156	0.050	0.624	0.013	0.251	0.079	1.604	0.034	0.0	0.0	10.6	9.0	0.3010
0022	-0.303	0.047	0.624	0.013	0.486	0.076	1.604	0.034	0.0	0.0	27.4	9.0	0.0013
0023	-0.382	0.[illegible]	0.624	0.013	0.629	0.086	1.604	0.034	0.0	0.0	9.1	9.0	0.4298
0024	-0.207	0.[illegible]50	0.624	0.013	0.332	0.080	1.604	0.034	0.0	0.0	13.4	9.0	0.1449
0025	-0.382	[illegible]053	0.624	0.013	0.565	0.086	1.604	0.034	0.0	0.0	6.6	9.0	0.6789
											500.1	225.0	0.0000

PARAMETER	MEAN	STN DEV
THRESHOLD	-0.335	0.681

QUADRATURE POINTS AND POSTERIOR WEIGHTS:

	1	2	3	4	5	6	7	8	9	10
POINT	-0.4008D+01	-0.3115D+01	-0.2223D+01	-0.1331D+01	-0.4388D+00	0.4534D+00	0.1346D+01	0.2238D+01	0.3130D+01	0.4022D+01
WEIGHT	0.1557D-06	0.4191D-04	0.6364D-02	0.1753D+00	0.3823D+00	0.2496D+00	0.1265D+00	0.5317D-01	0.6371D-02	0.2873D-03

EXHIBIT B-8.

ITEM PARAMETER ESTIMATES FOR ELECTRONICS KNOWLEDGE; 1-PARAMETER LOGISTIC MODEL

ITEM	INTERCEPT	S.E.	SLOPE	S.E.	THRESHOLD	S.E.	DISPERSN	S.E.	ASYMPTOTE	S.E.	CHISQ	DF	PROB
0001	0.985	0.059	0.636	0.015	-1.549	0.093	1.573	0.038	0.0	0.0	9.3	9.0	0.4067
0002	0.679	0.055	0.636	0.015	-1.069	0.086	1.573	0.038	0.0	0.0	17.0	9.0	0.0486
0003	0.591	0.055	0.636	0.015	-0.929	0.087	1.573	0.038	0.0	0.0	29.7	9.0	0.0005
0004	0.598	0.055	0.636	0.015	-0.942	0.087	1.573	0.038	0.0	0.0	37.5	9.0	0.0000
0005	0.841	0.056	0.636	0.015	-1.323	0.089	1.573	0.038	0.0	0.0	5.1	9.0	0.7305
0006	0.464	0.054	0.636	0.015	-0.730	0.085	1.573	0.038	0.0	0.0	38.6	9.0	0.0000
0007	0.515	0.052	0.636	0.015	-0.811	0.083	1.573	0.038	0.0	0.0	19.5	9.0	0.0210
0008	0.459	0.052	0.636	0.015	-0.723	0.081	1.573	0.038	0.0	0.0	15.3	9.0	0.0814
0009	0.591	0.051	0.636	0.015	-0.930	0.080	1.573	0.038	0.0	0.0	8.9	9.0	0.4474
0010	0.146	0.050	0.636	0.015	-0.230	0.079	1.573	0.038	0.0	0.0	14.9	9.0	0.0933
0011	-0.133	0.047	0.636	0.015	0.210	0.074	1.573	0.038	0.0	0.0	25.3	9.0	0.0019
0012	-0.076	0.051	0.636	0.015	0.120	0.080	1.573	0.038	0.0	0.0	9.5	9.0	0.3934
0013	-0.214	0.050	0.636	0.015	0.337	0.079	1.573	0.038	0.0	0.0	15.5	9.0	0.0775
0014	0.034	0.045	0.636	0.015	-0.054	0.071	1.573	0.038	0.0	0.0	38.4	9.0	0.0000
0015	-0.179	0.052	0.636	0.015	0.282	0.081	1.573	0.038	0.0	0.0	15.6	9.0	0.0762
0016	-0.193	0.049	0.636	0.015	0.304	0.078	1.573	0.038	0.0	0.0	8.8	9.0	0.4535
0017	-0.721	0.049	0.636	0.015	1.134	0.077	1.573	0.038	0.0	0.0	83.4	9.0	0.0000
0018	-0.205	0.050	0.636	0.015	0.323	0.078	1.573	0.038	0.0	0.0	6.3	9.0	0.7064
0019	-0.153	0.050	0.636	0.015	0.241	0.078	1.573	0.038	0.0	0.0	17.0	9.0	0.0488
0020	-0.579	0.053	0.636	0.015	0.911	0.084	1.573	0.038	0.0	0.0	19.4	9.0	0.0223
											437.0	180.0	0.0000

PARAMETER	MEAN	STN DEV
THRESHOLD	-0.271	0.755

QUADRATURE POINTS AND POSTERIOR WEIGHTS:

	1	2	3	4	5	6	7	8	9	10
POINT	-0.4002D+01	-0.3113D+01	-0.2223D+01	-0.1334D+01	-0.4446D+00	0.4449D+00	0.1334D+01	0.2224D+01	0.3113D+01	0.4003D+01
WEIGHT	0.5170D-05	0.5469D-03	0.8590D-01	0.1607D+00	0.3537D+00	0.2817D+00	0.1400D+00	0.3972D-01	0.4775D-02	0.2284D-03

APPENDIX C

ITEM PARAMETER ESTIMATES, 2-PARAMETER LOGISTIC MODEL

EXHIBIT C-1

ITEM PARAMETER ESTIMATES FOR GENERAL SCIENCE; 2-PARAMETER LOGISTIC MODEL

ITEM	INTERCEPT	S.E.	SLOPE	S.E.	THRESHOLD	S.E.	DISPERSN	S.E.	ASYMPTOTE	S.E.	CHISQ	DF	PROB
0001	2.136	0.177	1.505	0.182	-1.419	0.090	0.664	0.080	0.0	0.0	5.1	8.0	0.7537
0002	1.183	0.088	1.050	0.116	-1.127	0.087	0.953	0.105	0.0	0.0	4.5	8.0	0.8104
0003	1.343	0.113	1.426	0.155	-0.942	0.060	0.701	0.076	0.0	0.0	5.2	8.0	0.7356
0004	0.804	0.086	0.781	0.095	-1.029	0.104	1.280	0.156	0.0	0.0	3.6	8.0	0.8945
0005	1.003	0.073	0.905	0.102	-1.108	0.100	1.104	0.124	0.0	0.0	6.5	8.0	0.5872
0006	1.681	0.141	1.627	0.178	-1.033	0.060	0.615	0.067	0.0	0.0	3.9	8.0	0.8697
0007	0.785	0.071	0.878	0.106	-0.895	0.083	1.140	0.137	0.0	0.0	7.1	8.0	0.5298
0008	1.185	0.075	0.731	0.089	-1.621	0.164	1.368	0.166	0.0	0.0	11.0	8.0	0.1990
0009	1.089	0.083	1.027	0.115	-1.060	0.085	0.973	0.109	0.0	0.0	5.4	8.0	0.7206
0011	0.829	0.068	0.951	0.094	-0.871	0.075	1.051	0.104	0.0	0.0	4.1	8.0	0.8465
0012	0.075	0.047	0.475	0.071	-0.158	0.096	2.105	0.315	0.0	0.0	5.6	8.0	0.5861
0013	0.155	0.055	0.863	0.083	-0.180	0.059	1.159	0.125	0.0	0.0	14.3	8.0	0.0742
0014	0.494	0.064	0.667	0.079	-0.741	0.093	1.499	0.177	0.0	0.0	15.5	8.0	0.0506
0015	0.613	0.056	0.536	0.079	-1.145	0.155	1.867	0.275	0.0	0.0	5.1	8.0	0.7462
0016	0.585	0.053	0.616	0.071	-0.950	0.116	1.623	0.187	0.0	0.0	6.2	8.0	0.6310
0017	0.464	0.052	0.564	0.074	-0.822	0.114	1.773	0.234	0.0	0.0	19.7	8.0	0.0117
0018	-0.130	0.053	0.885	0.089	0.147	0.065	1.130	0.114	0.0	0.0	10.7	8.0	0.2200
0019	0.011	0.049	0.563	0.074	-0.019	0.086	1.776	0.233	0.0	0.0	28.9	8.0	0.0004
0020	0.093	0.049	0.678	0.074	-0.136	0.072	1.474	0.162	0.0	0.0	11.9	8.0	0.1531
0021	-0.301	0.049	0.532	0.065	0.565	0.112	1.878	0.228	0.0	0.0	3.1	8.0	0.9282
0022	-0.322	0.048	0.469	0.064	0.686	0.139	2.131	0.289	0.0	0.0	7.6	8.0	0.4763
0023	-0.348	0.049	0.431	0.059	0.808	0.152	2.319	0.318	0.0	0.0	7.9	8.0	0.4453
0024	-0.781	0.089	0.808	0.067	1.284	0.161	1.644	0.181	0.0	0.0	10.6	8.0	0.2259
0025	-0.323	0.061	0.554	0.078	0.583	0.128	1.805	0.253	0.0	0.0	33.6	8.0	0.0001
											287.2	200.0	0.0011

PARAMETER	MEAN	STN DEV
SLOPE	0.808	0.324
LOG(SLOPE)	-0.281	0.367
THRESHOLD	-0.491	0.790

QUADRATURE POINTS AND POSTERIOR WEIGHTS:

	1	2	3	4	5	6	7	8	9	10
POINT	-0.3885D+01	-0.3017D+01	-0.2168D+01	-0.1320D+01	-0.4716D+00	0.3767D+00	0.1225D+01	0.2073D+01	0.2922D+01	0.3770D+01
WEIGHT	0.1701D-13	0.5629D-06	0.7483D-02	0.1331D+00	1.4023D+00	0.3333D+00	0.5032D-01	0.3567D-01	0.3111D-01	0.6713D-02

EXHIBIT C-2

ITEM PARAMETER ESTIMATES FOR ARITHMETIC REASONING; 2-PARAMETER LOGISTIC MODEL

ITEM	INTERCEPT	S.E.	SLOPE	S.E.	THRESHOLD	S.E.	DISPERSN	S.E.	ASYMPTOTE	S.E.	CHISQ	DF	PROB
0001	1.526	0.097	0.555	0.118	-2.752	0.498	1.803	0.385	0.0	0.0	4.7	8.0	0.7898
0002	1.849	0.147	0.973	0.175	-1.901	0.233	1.028	0.185	0.0	0.0	5.9	8.0	0.6633
0003	1.418	0.116	1.658	0.146	-0.855	0.041	0.603	0.053	0.0	0.0	12.4	8.0	0.0985
0004	1.313	0.109	1.758	0.141	-0.747	0.037	0.569	0.046	0.0	0.0	10.1	8.0	0.2542
0005	0.659	0.073	1.167	0.104	-0.565	0.048	0.857	0.076	0.0	0.0	6.6	8.0	0.5824
0006	0.833	0.071	1.054	0.094	-0.790	0.089	0.948	0.085	0.0	0.0	8.3	8.0	0.4057
0007	0.799	0.080	0.549	0.078	-1.456	0.176	1.821	0.252	0.0	0.0	10.9	8.0	0.2089
0008	0.911	0.077	1.057	0.102	-0.862	0.062	0.946	0.091	0.0	0.0	5.3	8.0	0.7247
0009	0.815	0.074	1.078	0.102	-0.756	0.056	0.927	0.088	0.0	0.0	7.9	8.0	0.4419
0010	0.886	0.092	1.345	0.132	-0.659	0.043	0.744	0.073	0.0	0.0	4.5	8.0	0.8064
0011	1.055	0.103	2.101	0.163	-0.502	0.032	0.476	0.037	0.0	0.0	8.5	8.0	0.3882
0012	0.408	0.062	1.096	0.092	-0.373	0.049	0.913	0.077	0.0	0.0	7.3	8.0	0.5048
0013	0.365	0.057	0.805	0.078	-0.454	0.063	1.243	0.121	0.0	0.0	6.1	8.0	0.6337
0014	0.462	0.068	1.289	0.105	-0.358	0.044	0.776	0.063	0.0	0.0	9.1	8.0	0.3309
0015	0.634	0.074	1.307	0.108	-0.485	0.043	0.765	0.063	0.0	0.0	8.6	8.0	0.3923
0016	0.293	0.054	0.717	0.073	-0.409	0.069	1.395	0.142	0.0	0.0	16.4	8.0	0.0371
0017	0.095	0.053	0.743	0.075	-0.128	0.068	1.345	0.135	0.0	0.0	25.3	8.0	0.0015
0018	0.043	0.053	0.708	0.074	-0.061	0.072	1.413	0.147	0.0	0.0	30.7	8.0	0.0002
0019	0.204	0.053	0.752	0.077	-0.272	0.065	1.330	0.137	0.0	0.0	8.8	8.0	0.3519
0020	-0.378	0.057	0.953	0.077	0.396	0.064	1.049	0.084	0.0	0.0	20.6	8.0	0.0084
0021	-0.222	0.053	0.832	0.077	0.267	0.072	1.202	0.111	0.0	0.0	29.7	8.0	0.0003
0022	0.201	0.058	0.919	0.085	-0.219	0.067	1.088	0.101	0.0	0.0	15.0	8.0	0.1106
0023	0.095	0.051	0.704	0.068	-0.134	0.070	1.421	0.137	0.0	0.0	12.1	8.0	0.1473
0024	-0.138	0.057	0.938	0.085	0.147	0.066	1.066	0.096	0.0	0.0	30.3	8.0	0.0002
0025	-0.063	0.054	0.843	0.078	0.074	0.066	1.186	0.109	0.0	0.0	20.2	8.0	0.0096
0026	-0.059	0.053	0.813	0.075	0.073	0.066	1.230	0.113	0.0	0.0	9.0	8.0	0.3457
0027	-0.246	0.056	0.970	0.084	0.253	0.063	1.031	0.090	0.0	0.0	9.1	8.0	0.3370
0028	-0.516	0.065	0.661	0.065	0.780	0.108	1.512	0.149	0.0	0.0	8.1	8.0	0.4240
0029	-0.561	0.067	0.676	0.067	0.830	0.111	1.479	0.147	0.0	0.0	6.8	8.0	0.5858
0030	-0.103	0.054	0.719	0.070	0.144	0.079	1.391	0.135	0.0	0.0	16.6	8.0	0.0349
											374.7	240.0	0.0000

PARAMETER	MEAN	STN DEV
SLOPE	0.99	0.361
LOG(SLOPE)	-0.064	0.327
THRESHOLD	-0.302	0.733

QUADRATURE POINTS AND POSTERIOR WEIGHTS:

	1	2	3	4	5	6	7	8	9	10
POINT	-0.2917D+01	-0.2268D+01	-0.1621D+01	-0.9727D+00	-0.3246D+00	0.3236D+00	0.9717D+00	0.1620D+01	0.2268D+01	0.2916D+01
WEIGHT	0.2427D-07	0.1200D-02	0.1764D-02	0.3227D+00	0.2770D+00	0.1556D+00	0.1423D+00	0.2859D-01	0.4966D-01	0.2117D-01

EXHIBIT C-3

ITEM PARAMETER ESTIMATES FOR WORD KNOWLEDGE; 2-PARAMETER LOGISTIC MODEL

ITEM	INTERCEPT	S.E.	SLOPE	S.E.	THRESHOLD	S.E.	DISPERSN	S.E.	ASYMPTOTE	S.E.	CHISQ	DF	PROB
0001	2.443	0.192	1.379	0.160	-1.771	0.110	0.725	0.084	0.0	0.0	6.2	8.0	0.6239
0002	2.459	0.184	1.376	0.153	-1.787	0.111	0.727	0.081	0.0	0.0	3.6	8.0	0.8928
0003	2.336	0.179	1.597	0.155	-1.463	0.070	0.626	0.061	0.0	0.0	8.4	8.0	0.3998
0004	1.416	0.091	0.746	0.091	-1.900	0.179	1.341	0.164	0.0	0.0	10.2	8.0	0.2510
0005	2.417	0.170	1.401	0.143	-1.725	0.103	0.714	0.073	0.0	0.0	14.2	8.0	0.0765
0006	2.370	0.244	1.929	0.228	-1.229	0.050	0.518	0.061	0.0	0.0	1.8	8.0	0.9849
0007	1.513	0.102	0.951	0.101	-1.592	0.117	1.052	0.112	0.0	0.0	5.5	8.0	0.7066
0008	2.174	0.192	1.802	0.178	-1.206	0.050	0.555	0.055	0.0	0.0	4.9	8.0	0.7726
0009	0.704	0.063	0.891	0.081	-0.790	0.072	1.123	0.102	0.0	0.0	7.8	8.0	0.4504
0010	2.464	0.180	1.641	0.156	-1.502	0.074	0.609	0.058	0.0	0.0	19.7	8.0	0.0115
0011	1.338	0.105	1.304	0.120	-1.026	0.059	0.767	0.070	0.0	0.0	5.8	8.0	0.6765
0012	1.321	0.086	0.875	0.091	-1.510	0.121	1.143	0.119	0.0	0.0	12.1	8.0	0.1457
0013	1.697	0.134	1.278	0.132	-1.327	0.075	0.782	0.081	0.0	0.0	3.6	8.0	0.8952
0014	1.156	0.093	1.216	0.109	-0.951	0.059	0.823	0.074	0.0	0.0	3.9	8.0	0.8695
0015	1.552	0.127	1.616	0.145	-0.960	0.048	0.619	0.055	0.0	0.0	14.9	8.0	0.0609
0016	1.088	0.079	0.986	0.087	-1.103	0.077	1.016	0.090	0.0	0.0	8.5	8.0	0.3883
0017	1.352	0.118	1.607	0.141	-0.841	0.045	0.622	0.055	0.0	0.0	2.1	8.0	0.9784
0018	1.242	0.100	1.234	0.113	-1.006	0.060	0.810	0.074	0.0	0.0	5.6	8.0	0.6913
0019	0.629	0.062	0.845	0.079	-0.745	0.071	1.184	0.111	0.0	0.0	10.1	8.0	0.2580
0020	1.616	0.129	1.546	0.138	-1.045	0.052	0.647	0.058	0.0	0.0	6.3	8.0	0.6205
0021	1.051	0.088	0.992	0.104	-1.059	0.075	1.008	0.106	0.0	0.0	13.0	8.0	0.1101
0022	0.785	0.082	1.162	0.10[illegible]	-0.675	0.051	0.880	0.077	0.0	0.0	27.8	8.0	0.0006
0023	0.416	0.065	1.063	0.091	-0.391	0.052	0.940	0.081	0.0	0.0	21.1	8.0	0.0071
0024	0.204	0.060	0.588	0.062	-0.360	0.086	1.761	0.193	0.0	0.0	10.3	8.0	0.2418
0025	0.341	0.064	0.693	0.073	-0.492	0.076	1.443	0.152	0.0	0.0	10.0	8.0	0.2638
0026	0.588	0.070	1.152	0.095	-0.510	0.051	0.868	0.072	0.0	0.0	21.7	8.0	0.0057
0027	0.302	0.052	0.884	0.068	-0.442	0.078	1.462	0.144	0.0	0.0	9.1	8.0	0.3336
0028	0.572	0.062	0.802	0.082	-0.713	0.076	1.247	0.127	0.0	0.0	9.5	8.0	0.2979
0029	-0.027	0.048	0.477	0.056	0.056	0.100	2.096	0.248	0.0	0.0	10.0	8.0	0.2615
0030	0.033	0.050	0.614	0.066	-0.053	0.081	1.630	0.178	0.0	0.0	8.1	8.0	0.4227
0031	1.882	0.140	1.373	0.152	-1.225	0.076	0.729	0.081	0.0	0.0	8.8	8.0	0.3599
0032	0.004	0.048	0.438	0.058	-0.009	0.109	2.284	0.304	0.0	0.0	11.9	8.0	0.1566
0033	-0.138	0.051	0.636	0.067	0.219	0.087	1.571	0.166	0.0	0.0	41.5	8.0	0.0000
0034	0.218	0.054	0.801	0.077	-0.272	0.069	1.248	0.119	0.0	0.0	14.9	8.0	0.0601
0035	0.131	0.061	1.142	0.097	-0.115	0.052	0.876	0.074	0.0	0.0	13.2	8.0	0.1061
											386.0	280.0	0.0000

PARAMETER	MEAN	STN DEV
SLOPE	1.109	0.394
LOG(SLOPE)	0.036	0.386
THRESHOLD	-0.901	0.575

QUADRATURE POINTS AND POSTERIOR WEIGHTS:

	1	2	3	4	5	6	7	8	9	10
POINT	-0.2857D+01	-0.2247D+01	-0.1637D+01	-0.1027D+01	-0.4178D+00	0.1919D+00	0.8016D+00	0.1411D+01	0.2021D+01	0.2631D+01
WEIGHT	0.2819D-34	0.1053D-14	0.7640D-01	0.1869D+00	0.2148D+00	0.2602D+00	0.1062D+00	0.7928D-01	0.6460D-01	0.1186D-01

EXHIBIT C-4

ITEM PARAMETER ESTIMATES FOR PARAGRAPH COMPREHENSION; 2-PARAMETER LOGISTIC MODEL

ITEM	INTERCEPT	S.E.	SLOPE	S.E.	THRESHOLD	S.E.	DISPERSN	S.E.	ASYMPTOTE	S.E.	CHISQ	DF	PROB
0001	1.025	0.082	0.857	0.090	-1.195	0.095	1.167	0.122	0.0	0.0	5.1	7.0	0.6534
0002	[illegible].897	0.116	0.866	0.107	-1.844	0.152	1.155	0.142	0.0	0.0	10.5	7.0	0.1620
0003	1.910	0.202	1.601	0.184	-1.192	0.067	0.625	0.072	0.0	0.0	7.3	7.0	0.4004
0004	0.718	0.061	0.655	0.071	-1.096	0.113	1.528	0.165	0.0	0.0	4.4	7.0	0.7294
0005	0.816	0.074	1.079	0.098	-0.757	0.067	0.927	0.084	0.0	0.0	14.6	7.0	0.0409
0006	0.702	0.062	0.665	0.074	-1.056	0.109	1.504	0.168	0.0	0.0	10.7	7.0	0.1528
0007	0.765	0.063	0.702	0.074	-1.090	0.108	1.425	0.150	0.0	0.0	5.1	7.0	0.6495
0008	0.898	0.065	0.585	0.073	-1.536	0.168	1.710	0.213	0.0	0.0	4.6	7.0	0.7161
0009	0.951	0.080	0.980	0.095	-0.990	0.078	1.042	0.103	0.0	0.0	14.3	7.0	0.0461
0010	0.122	0.053	0.811	0.080	-0.151	0.066	1.233	0.122	0.0	0.0	5.7	7.0	0.5747
0011	0.687	0.056	0.480	0.065	-1.493	0.203	2.174	0.306	0.0	0.0	14.5	7.0	0.0420
0012	0.294	0.052	0.678	0.071	-0.434	0.081	1.475	0.154	0.0	0.0	6.9	7.0	0.4398
0013	1.019	0.082	0.919	0.094	-1.109	0.089	1.088	0.112	0.0	0.0	5.6	7.0	0.5937
0014	0.489	0.055	0.649	0.071	-0.753	0.100	1.541	0.168	0.0	0.0	11.0	7.0	0.1391
0015	-0.037	0.044	0.133	0.043	0.282	0.342	7.534	2.453	0.0	0.0	141.8	7.0	0.0000
											261.9	105.0	0.0000

PARAMETER	MEAN	STN DEV
SLOPE	0.775	0.322
LOG(SLOPE)	-0.362	0.544
THRESHOLD	-0.961	0.543

QUADRATURE POINTS AND POSTERIOR WEIGHTS:

	1	2	3	4	5	6	7	8	9	10
POINT	-0.4069D+01	-0.3166D+01	-0.2263D+01	-0.1361D+01	-0.4578D+00	0.4450D+00	0.1348D+01	0.2251D+01	0.3153D+01	0.4056D+01
WEIGHT	0.7925D-05	0.1360D-03	0.1613D-01	0.1967D+00	0.2410D+00	0.3787D+00	0.1387D+00	0.2613D-01	0.2443D-02	0.1019D-03

EXHIBIT C-5

ITEM PARAMETER ESTIMATES FOR AUTO AND SHOP INFORMATION; 2-PARAMETER LOGISTIC MODEL

ITEM	INTERCEPT	S.E.	SLOPE	S.E.	THRESHOLD	S.E.	DISPERSN	S.E.	ASYMPTOTE	S.E.	CHISQ	DF	PROB
0001	0.713	0.054	0.351	0.085	-2.032	0.357	2.852	0.529	0.0	0.0	6.3	8.0	0.6171
0002	1.089	0.079	0.753	0.101	-1.459	0.149	1.328	0.178	0.0	0.0	10.3	8.0	0.2446
0003	0.547	0.068	1.076	0.107	-0.508	0.051	0.929	0.092	0.0	0.0	8.2	8.0	0.4108
0004	1.180	0.091	0.723	0.122	-1.633	0.200	1.383	0.233	0.0	0.0	3.3	8.0	0.9141
0005	0.844	0.102	1.478	0.179	-0.571	0.041	0.677	0.082	0.0	0.0	17.7	8.0	0.0234
0006	0.324	0.079	1.306	0.146	-0.234	0.044	0.721	0.076	0.0	0.0	9.3	8.0	0.3171
0007	0.078	0.054	0.776	0.080	-0.100	0.066	1.288	0.133	0.0	0.0	18.7	8.0	0.0164
0008	0.388	0.047	0.339	0.085	-1.058	0.199	2.953	0.477	0.0	0.0	7.8	8.0	0.4495
0009	0.432	0.047	0.257	0.050	-1.678	0.353	3.888	0.758	0.0	0.0	11.8	8.0	0.1580
0010	0.386	0.057	0.771	0.086	-0.500	0.068	1.297	0.145	0.0	0.0	4.9	8.0	0.7726
0011	0.190	0.048	0.501	0.065	-0.379	0.095	1.996	0.259	0.0	0.0	5.2	8.0	0.7387
0012	0.277	0.047	0.394	0.057	-0.705	0.141	2.540	0.365	0.0	0.0	6.2	8.0	0.6271
0013	0.403	0.056	0.883	0.084	-0.456	0.061	1.132	0.108	0.0	0.0	17.2	8.0	0.0281
0014	0.476	0.065	0.922	0.108	-0.517	0.058	1.085	0.127	0.0	0.0	10.5	8.0	0.2311
0015	0.095	0.054	0.819	0.085	-0.115	0.062	1.221	0.127	0.0	0.0	7.7	8.0	0.4611
0016	0.126	0.056	0.896	0.082	-0.140	0.058	1.116	0.114	0.0	0.0	8.4	8.0	0.3961
0017	-0.216	0.057	0.971	0.089	0.223	0.068	1.030	0.105	0.0	0.0	13.7	8.0	0.0886
0018	-0.199	0.057	0.926	0.084	0.215	0.071	1.080	0.109	0.0	0.0	25.3	8.0	0.0015
0019	0.443	0.050	0.483	0.061	-0.918	0.135	2.072	0.261	0.0	0.0	25.0	8.0	0.0016
0020	0.072	0.049	0.630	0.071	-0.115	0.077	1.588	0.179	0.0	0.0	12.6	8.0	0.1249
0021	-0.217	0.048	0.471	0.056	0.461	0.115	2.124	0.252	0.0	0.0	10.7	8.0	0.2185
0022	-0.217	0.056	0.909	0.085	0.239	0.069	1.101	0.102	0.0	0.0	10.2	8.0	0.2474
0023	-0.694	0.070	1.291	0.113	0.538	0.064	0.775	0.068	0.0	0.0	6.8	8.0	0.5558
0024	-0.807	0.086	0.619	0.064	0.979	0.125	1.614	0.166	0.0	0.0	10.9	8.0	0.2078
0025	-0.220	0.047	0.332	0.050	0.663	0.167	3.008	0.450	0.0	0.0	8.6	8.0	0.3728
											277.6	200.0	0.0002

PARAMETER	MEAN	STN DEV
SLOPE	0.758	0.331
LOG(SLOPE)	-0.377	0.474
THRESHOLD	-0.392	0.763

QUADRATURE POINTS AND POSTERIOR WEIGHTS:

	1	2	3	4	5	6	7	8	9	10
POINT	-0.3888D+01	-0.3023D+01	-0.2159D+01	-0.1294D+01	-0.4290D+00	0.4359D+00	0.1301D+01	0.2166D+01	0.3030D+01	0.3895D+01
WEIGHT	0.7130D-09	0.8778D-06	0.3409D-03	0.1528D+00	0.4810D+00	0.1838D+00	0.8518D-01	0.7054D-01	0.1555D-01	0.7504D-03

EXHIBIT C-6

ITEM PARAMETER ESTIMATES FOR MATHEMATICS KNOWLEDGE; 2-PARAMETER LOGISTIC MODEL

ITEM	INTERCEPT	S.E.	SLOPE	S.E.	THRESHOLD	S.E.	DISPERSN	S.E.	ASYMPTOTE	S.E.	CHISQ	DF	PROB
0001	1.917	0.235	1.892	0.326	-1.133	0.095	0.591	0.114	0.0	0.0	11.2	8.0	0.1912
0002	0.982	0.079	0.852	0.112	-1.164	0.109	1.173	0.155	0.0	0.0	12.4	8.0	0.1338
0003	0.475	0.064	1.062	0.099	-0.447	0.049	0.942	0.088	0.0	0.0	22.7	8.0	0.0038
0004	0.944	0.087	1.312	0.127	-0.720	0.046	0.762	0.074	0.0	0.0	17.0	8.0	0.0299
0005	0.726	0.057	0.572	0.073	-1.270	0.148	1.748	0.224	0.0	0.0	16.9	8.0	0.0309
0006	0.484	0.070	1.309	0.113	-0.364	0.042	0.764	0.066	0.0	0.0	13.4	8.0	0.0968
0007	0.777	0.097	1.374	0.153	-0.566	0.040	0.728	0.081	0.0	0.0	5.3	8.0	0.7276
0008	0.286	0.052	0.761	0.073	-0.380	0.066	1.331	0.130	0.0	0.0	23.8	8.0	0.0026
0009	0.717	0.076	1.131	0.117	-0.634	0.050	0.884	0.092	0.0	0.0	4.5	8.0	0.8126
0010	0.401	0.062	0.854	0.09	-0.470	0.069	1.172	0.136	0.0	0.0	10.3	8.0	0.2443
0011	0.157	0.049	0.568	0.068	-0.277	0.082	1.780	0.209	0.0	0.0	1.6	8.0	0.9894
0012	0.058	0.059	1.160	0.095	-0.047	0.049	0.862	0.070	0.0	0.0	10.5	8.0	0.2331
0013	0.475	0.084	1.748	0.148	-0.272	0.037	0.572	0.048	0.0	0.0	19.4	8.0	0.0128
0014	-0.062	0.063	1.212	0.113	0.051	0.054	0.825	0.077	0.0	0.0	11.1	8.0	0.1947
0015	-0.247	0.047	0.445	0.064	0.555	0.126	2.246	0.274	0.0	0.0	7.5	8.0	0.4827
0016	0.257	0.067	1.078	0.114	-0.239	0.050	0.928	0.099	0.0	0.0	11.5	8.0	0.1733
0017	-0.125	0.060	1.240	0.100	0.101	0.050	0.806	0.065	0.0	0.0	10.0	8.0	0.2689
0018	0.132	0.068	1.273	0.120	-0.104	0.049	0.785	0.074	0.0	0.0	17.6	8.0	0.0243
0019	0.216	0.053	0.768	0.074	-0.282	0.064	1.302	0.126	0.0	0.0	15.5	8.0	0.0503
0020	-0.056	0.050	0.655	0.071	0.086	0.079	1.526	0.166	0.0	0.0	10.3	8.0	0.2433
0021	-0.229	0.049	0.589	0.065	0.389	0.100	1.696	0.188	0.0	0.0	15.8	8.0	0.0456
0022	-0.460	0.057	0.851	0.078	0.540	0.088	1.175	0.107	0.0	0.0	20.0	8.0	0.0103
0023	-0.637	0.060	0.878	0.075	0.725	0.088	1.139	0.098	0.0	0.0	19.7	8.0	0.0116
0024	-0.587	0.055	0.591	0.059	0.993	0.122	1.692	0.168	0.0	0.0	11.3	8.0	0.1855
0025	-0.529	0.068	0.815	0.078	0.648	0.094	1.227	0.117	0.0	0.0	14.1	8.0	0.0791
											333.5	200.0	0.0000

PARAMETER	MEAN	STN DEV
SLOPE	0.991	0.351
LOG(SLOPE)	-0.071	0.365
THRESHOLD	-0.171	0.584

QUADRATURE POINTS AND POSTERIOR WEIGHTS:

	1	2	3	4	5	6	7	8	9	10
POINT	-0.3958D+01	-0.3148D+01	-0.2338D+01	-0.1528D+01	-0.7183D+00	0.9173D-01	0.9017D+00	0.1712D+01	0.2522D+01	0.3332D+01
WEIGHT	0.1425D-23	0.1486D-18	0.4040D-11	0.2051D-01	0.4852D+00	0.2672D+00	0.1021D+00	0.7332D-01	0.4171D-01	0.9990D-02

EXHIBIT C-7

ITEM PARAMETER ESTIMATES FOR MECHANICAL REASONING; 2-PARAMETER LOGISTIC MODEL

ITEM	INTERCEPT	S.E.	SLOPE	S.E.	THRESHOLD	S.E.	DISPERSN	S.E.	ASYMPTOTE	S.E.	CHISQ	DF	PROB
0001	1.363	0.092	0.626	0.106	-2.177	0.292	1.587	0.271	0.0	0.0	10.9	8.0	0.2055
0002	1.125	0.106	1.092	0.139	-1.030	0.075	0.816	0.116	0.0	0.0	15.2	8.0	0.0543
0003	0.973	0.074	0.738	0.093	-1.319	0.128	1.355	0.171	0.0	0.0	8.2	8.0	0.4157
0004	-0.235	0.049	0.567	0.060	0.415	0.097	1.765	0.187	0.0	0.0	5.1	8.0	0.7515
0005	0.264	0.053	0.753	0.074	-0.351	0.068	1.329	0.130	0.0	0.0	12.4	8.0	0.1331
0006	0.261	0.047	0.390	0.059	-0.669	0.137	2.562	0.388	0.0	0.0	13.4	8.0	0.0985
0007	0.279	0.055	0.709	0.081	-0.393	0.070	1.409	0.160	0.0	0.0	12.6	8.0	0.1271
0008	0.602	0.069	1.148	0.108	-0.525	0.051	0.871	0.082	0.0	0.0	18.9	8.0	0.0312
0009	0.488	0.051	0.523	0.062	-0.932	0.123	1.912	0.226	0.0	0.0	15.1	8.0	0.0408
0010	0.491	0.068	1.307	0.108	-0.375	0.045	0.765	0.063	0.0	0.0	33.5	8.0	0.0001
0011	0.454	0.050	0.427	0.062	-1.062	0.162	2.340	0.340	0.0	0.0	3.9	8.0	0.8643
0012	0.307	0.060	0.899	0.089	-0.341	0.058	1.112	0.110	0.0	0.0	14.9	8.0	0.0602
0013	0.541	0.067	0.910	0.099	-0.594	0.061	1.099	0.119	0.0	0.0	12.8	8.0	0.1170
0014	0.310	0.059	0.908	0.090	-0.341	0.058	1.101	0.109	0.0	0.0	7.0	8.0	0.5337
0015	0.242	0.053	0.795	0.079	-0.305	0.064	1.257	0.125	0.0	0.0	18.8	8.0	0.0159
0016	0.249	0.048	0.499	0.061	-0.499	0.102	2.005	0.246	0.0	0.0	12.7	8.0	0.1231
0017	0.033	0.048	0.508	0.060	-0.065	0.093	1.969	0.231	0.0	0.0	14.7	8.0	0.0657
0018	0.030	0.052	0.714	0.073	-0.043	0.072	1.401	0.143	0.0	0.0	22.8	8.0	0.0037
0019	-0.188	0.045	0.310	0.050	0.608	0.181	3.230	0.517	0.0	0.0	28.3	8.0	0.0005
0020	0.079	0.049	0.579	0.064	-0.136	0.083	1.728	0.192	0.0	0.0	12.2	8.0	0.1431
0021	-0.139	0.050	0.640	0.069	0.218	0.085	1.563	0.168	0.0	0.0	8.8	8.0	0.3576
0022	-0.271	0.047	0.374	0.052	0.726	0.160	2.676	0.371	0.0	0.0	8.8	8.0	0.3580
0023	-0.392	0.055	0.778	0.078	0.504	0.083	1.286	0.128	0.0	0.0	9.5	8.0	0.2983
0024	-0.189	0.049	0.539	0.061	0.351	0.099	1.856	0.209	0.0	0.0	14.0	8.0	0.0805
0025	-0.341	0.054	0.716	0.070	0.476	0.088	1.396	0.137	0.0	0.0	6.3	8.0	0.6103
											340.0	200.0	0.0000

PARAMETER	MEAN	STN DEV
SLOPE	0.698	0.248
LOG(SLOPE)	-0.420	0.358
THRESHOLD	-0.314	0.673

QUADRATURE POINTS AND POSTERIOR WEIGHTS:

	1	2	3	4	5	6	7	8	9	10
POINT	-0.3798D+01	-0.2957D+01	-0.2115D+01	-0.1273D+01	-0.4314D+00	0.4104D+00	0.1252D+01	0.2094D+01	0.2936D+01	0.3777D+01
WEIGHT	0.2665D-12	0.7291D-08	0.2135D-03	0.1889D+00	0.3903D+00	0.2356D+00	0.1004D+00	0.6872D-01	0.1485D-01	0.9856D-03

EXHIBIT C-8

ITEM PARAMETER ESTIMATES FOR ELECTRONICS KNOWLEDGE; 2-PARAMETER LOGISTIC MODEL

ITEM	INTERCEPT	S.E.	SLOPE	S.E.	THRESHOLD	S.E.	DISPERSN	S.E.	ASYMPTOTE	S.E.	CHISQ	DF	PROB
0001	1.096	0.085	0.861	0.112	-1.274	0.117	1.152	0.151	0.0	0.0	5.4	8.0	0.7194
0002	0.834	0.084	0.974	0.120	-0.856	0.070	1.026	0.126	0.0	0.0	9.8	8.0	0.2940
0003	0.831	0.089	1.180	0.136	-0.704	0.054	0.847	0.097	0.0	0.0	6.0	8.0	0.6529
0004	0.893	0.086	1.295	0.135	-0.690	0.052	0.772	0.080	0.0	0.0	9.7	8.0	0.2827
0005	0.938	0.078	0.839	0.107	-1.118	0.103	1.192	0.152	0.0	0.0	2.8	8.0	0.9436
0006	0.679	0.078	1.176	0.125	-0.577	0.051	0.850	0.090	0.0	0.0	12.4	8.0	0.1337
0007	0.635	0.070	0.926	0.106	-0.686	0.065	1.080	0.124	0.0	0.0	3.4	8.0	0.7208
0008	0.513	0.057	0.753	0.078	-0.681	0.078	1.328	0.138	0.0	0.0	11.7	8.0	0.1626
0009	0.582	0.057	0.576	0.076	-1.010	0.123	1.736	0.228	0.0	0.0	10.3	8.0	0.2429
0010	0.208	0.054	0.821	0.086	-0.253	0.062	1.219	0.128	0.0	0.0	4.6	8.0	0.8003
0011	-0.113	0.046	0.425	0.059	0.265	0.117	2.353	0.327	0.0	0.0	8.6	8.0	0.3745
0012	-0.030	0.053	0.828	0.085	0.036	0.065	1.206	0.124	0.0	0.0	10.2	8.0	0.2521
0013	-0.184	0.051	0.714	0.079	0.258	0.078	1.401	0.166	0.0	0.0	4.8	8.0	0.7796
0014	0.030	0.045	0.289	0.050	-0.099	0.149	3.341	0.550	0.0	0.0	15.9	8.0	0.0315
0015	-0.142	0.053	0.850	0.084	0.167	0.067	1.176	0.116	0.0	0.0	18.6	8.0	0.0169
0016	-0.166	0.049	0.586	0.067	0.281	0.091	1.706	0.194	0.0	0.0	5.0	8.0	0.7591
0017	-0.593	0.049	0.164	0.045	3.611	1.010	6.090	1.674	0.0	0.0	7.5	8.0	0.4871
0018	-0.176	0.049	0.588	0.068	0.300	0.090	1.701	0.197	0.0	0.0	7.5	8.0	0.4857
0019	-0.123	0.050	0.642	0.075	0.192	0.083	1.557	0.181	0.0	0.0	8.6	8.0	0.3746
0020	-0.544	0.054	0.590	0.067	0.923	0.129	1.696	0.192	0.0	0.0	10.3	8.0	0.2429
											175.9	160.0	0.1841

PARAMETER	MEAN	STN DEV
SLOPE	0.754	0.287
LOG(SLOPE)	-0.373	0.486
THRESHOLD	-0.096	1.052

QUADRATURE POINTS AND POSTERIOR WEIGHTS:

	1	2	3	4	5	6	7	8	9	10
POINT	-0.3896D+01	-0.3034D+01	-0.2171D+01	-0.1308D+01	-0.4458D+00	0.4167D+00	0.1279D+01	0.2142D+01	0.3005D+01	0.3867D+01
WEIGHT	0.1483D-09	0.2021D-06	0.4475D-03	0.1666D+00	0.4162D+00	0.2469D+00	0.9841D-01	0.5043D-01	0.1900D-01	0.1944D-02

APPENDIX D

ITEM PARAMETER ESTIMATES, 3-PARAMETER LOGISTIC MODEL

EXHIBIT D-1

ITEM PARAMETER ESTIMATES FOR GENERAL SCIENCE; 3-PARAMETER LOGISTIC MODEL

ITEM	INTERCEPT	S.E.	SLOPE	S.E.	THRESHOLD	S.E.	DISPERSN	S.E.	ASYMPTOTE	S.E.	CHISQ	DF	PROB
0001	1.715	0.157	1.127	0.180	-1.522	0.215	0.888	0.141	0.204	0.085	1.4	7.0	0.9835
0002	0.862	0.112	1.003	0.158	-0.860	0.184	0.997	0.157	0.213	0.075	3.0	7.0	0.8873
0003	0.938	0.116	1.484	0.263	-0.632	0.127	0.674	0.120	0.220	0.063	7.1	7.0	0.4195
0004	0.484	0.121	0.805	0.137	-0.601	0.215	1.242	0.212	0.226	0.078	9.2	7.0	0.2369
0005	0.759	0.098	0.808	0.115	-0.938	0.192	1.237	0.176	0.159	0.068	3.0	7.0	0.8850
0006	1.305	0.129	1.478	0.239	-0.883	0.133	0.676	0.109	0.174	0.063	3.9	7.0	0.7973
0007	0.324	0.138	1.035	0.206	-0.313	0.174	0.966	0.193	0.291	0.071	7.5	7.0	0.3823
0008	0.976	0.106	0.643	0.091	-1.517	0.275	1.555	0.220	0.185	0.082	16.4	7.0	0.0218
0009	0.769	0.109	0.969	0.149	-0.793	0.182	1.032	0.159	0.204	0.073	4.2	7.0	0.7582
0010	0.682	0.106	0.823	0.123	-0.829	0.201	1.215	0.182	0.189	0.074	8.5	7.0	0.2863
0011	0.478	0.114	1.036	0.150	-0.461	0.148	0.965	0.139	0.218	0.064	10.8	7.0	0.1465
0012	-1.324	0.396	1.636	0.458	0.810	0.100	0.611	0.171	0.374	0.035	16.2	7.0	0.0234
0013	-0.966	0.340	2.338	0.953	0.413	0.077	0.428	0.174	0.262	0.041	17.7	7.0	0.0136
0014	0.212	0.119	0.729	0.122	-0.290	0.194	1.371	0.229	0.188	0.069	1.6	7.0	0.9781
0015	0.297	0.142	0.585	0.118	-0.507	0.310	1.709	0.345	0.248	0.090	6.7	7.0	0.4647
0016	0.396	0.096	0.623	0.088	-0.636	0.206	1.606	0.228	0.145	0.064	13.1	7.0	0.0699
0017	0.135	0.142	0.662	0.126	-0.205	0.240	1.511	0.287	0.230	0.078	9.1	7.0	0.2441
0018	-1.692	0.752	3.130	1.355	0.541	0.036	0.320	0.138	0.197	0.025	20.4	7.0	0.0049
0019	-0.893	0.274	1.293	0.308	0.691	0.103	0.773	0.184	0.290	0.042	12.7	7.0	0.0794
0020	-0.265	0.140	0.898	0.150	0.295	0.126	1.113	0.186	0.162	0.052	8.8	7.0	0.2677
0021	-0.782	0.194	0.859	0.170	0.910	0.129	1.164	0.231	0.156	0.043	7.8	7.0	0.3518
0022	-1.326	0.324	1.196	0.284	1.109	0.122	0.836	0.199	0.230	0.035	4.4	7.0	0.7302
0023	-1.162	0.280	1.020	0.233	1.139	0.133	0.981	0.224	0.207	0.038	15.8	7.0	0.0187
0024	-2.379	0.435	2.143	0.394	1.110	0.078	0.467	0.086	0.128	0.020	26.6	7.0	0.0004
0025	-3.411	0.982	3.736	1.185	0.913	0.114	0.268	0.085	0.272	0.025	53.1	7.0	0.0000
											289.9	175.0	0.0000

PARAMETER	MEAN	STN DEV
ASYMPTOTE	0.215	0.064
SLOPE	1.282	0.788
LOG(SLOPE)	0.116	0.482
THRESHOLD	-0.122	0.840

QUADRATURE POINTS AND POSTERIOR WEIGHTS:

	1	2	3	4	5	6	7	8	9	10
POINT	-0.3586D+01	-0.2762D+01	-0.1936D+01	-0.1111D+01	-0.2859D+00	0.5392D+00	0.1385D+01	0.2189D+01	0.3014D+01	0.3838D+01
WEIGHT	0.3291D-02	0.2575D-01	0.4285D-01	0.1096D+00	0.3444D+00	0.3587D+00	0.8523D-01	0.2502D-01	0.5003D-02	0.2040D-03

EXHIBIT D-2

ITEM PARAMETER ESTIMATES FOR ARITHMETIC REASONING; 3-PARAMETER LOGISTIC MODEL

ITEM	INTERCEPT	S.E.	SLOPE	S.E.	THRESHOLD	S.E.	DISPERSN	S.E.	ASYMPTOTE	S.E.	CHISQ	DF	PROB
0001	1.345	0.122	0.495	0.096	-2.718	0.498	2.021	0.392	0.210	0.092	6.9	7.0	0.4348
0002	1.604	0.144	0.780	0.121	-2.109	0.283	1.315	0.208	0.202	0.090	14.4	7.0	0.0435
0003	1.023	0.117	1.451	0.169	-0.705	0.107	0.689	0.080	0.149	0.061	9.6	7.0	0.2144
0004	0.831	0.121	1.662	0.197	-0.500	0.098	0.602	0.071	0.173	0.055	10.3	7.0	0.1688
0005	0.151	0.139	1.460	0.215	-0.103	0.122	0.685	0.101	0.230	0.050	12.3	7.0	0.0890
0006	0.578	0.105	1.040	0.123	-0.555	0.133	0.961	0.113	0.148	0.063	5.5	7.0	0.5963
0007	0.605	0.118	0.551	0.083	-1.098	0.252	1.814	0.273	0.207	0.089	9.6	7.0	0.2141
0008	0.602	0.117	1.003	0.127	-0.601	0.157	0.997	0.127	0.183	0.073	9.1	7.0	0.2475
0009	0.523	0.110	1.040	0.132	-0.503	0.140	0.962	0.122	0.160	0.066	5.4	7.0	0.6154
0010	0.350	0.138	1.610	0.293	-0.217	0.110	0.621	0.113	0.260	0.055	11.3	7.0	0.1242
0011	0.523	0.104	2.081	0.233	-0.251	0.061	0.481	0.054	0.096	0.032	22.1	7.0	0.0026
0012	-0.003	0.125	1.294	0.172	0.002	0.097	0.773	0.102	0.160	0.044	14.7	7.0	0.0382
0013	-0.177	0.173	1.172	0.198	0.151	0.129	0.853	0.145	0.261	0.053	8.0	7.0	0.3338
0014	0.033	0.120	1.549	0.201	-0.021	0.078	0.646	0.084	0.139	0.039	7.9	7.0	0.3435
0015	0.167	0.125	1.560	0.208	-0.101	0.088	0.641	0.086	0.182	0.044	12.3	7.0	0.0908
0016	-0.612	0.232	1.522	0.278	0.402	0.100	0.657	0.120	0.340	0.038	19.1	7.0	0.0082
0017	-1.001	0.280	1.768	0.330	0.567	0.078	0.568	0.106	0.289	0.031	8.9	7.0	0.2560
0018	-1.793	0.465	2.759	0.618	0.650	0.054	0.362	0.081	0.311	0.025	6.2	7.0	0.5119
0019	-0.214	0.163	1.012	0.189	0.212	0.133	0.988	0.185	0.200	0.056	13.9	7.0	0.0532
0020	-0.811	0.152	1.347	0.175	0.602	0.064	0.742	0.097	0.079	0.023	13.2	7.0	0.0668
0021	-1.319	0.296	1.978	0.369	0.667	0.059	0.506	0.094	0.185	0.025	10.9	7.0	0.1435
0022	-0.624	0.209	1.749	0.301	0.357	0.076	0.572	0.098	0.250	0.034	8.0	7.0	0.3342
0023	-0.689	0.215	1.386	0.240	0.497	0.094	0.722	0.125	0.262	0.037	21.9	7.0	0.0028
0024	-1.625	0.526	2.775	0.784	0.585	0.049	0.360	0.102	0.205	0.024	9.7	7.0	0.2040
0025	-1.036	0.261	1.775	0.318	0.584	0.070	0.563	0.101	0.219	0.028	9.5	7.0	0.2156
0026	-0.530	0.166	1.163	0.185	0.456	0.093	0.860	0.137	0.152	0.038	10.8	7.0	0.1455
0027	-0.690	0.152	1.355	0.192	0.510	0.069	0.738	0.104	0.095	0.028	8.8	7.0	0.2653
0028	-1.513	0.316	1.518	0.297	0.997	0.076	0.659	0.129	0.152	0.024	7.3	7.0	0.3990
0029	-1.570	0.326	1.562	0.308	1.005	0.075	0.640	0.126	0.139	0.023	5.7	7.0	0.5793
0030	-0.834	0.229	1.305	0.234	0.639	0.094	0.766	0.138	0.203	0.035	10.1	7.0	0.1828
											323.5	210.0	0.0000

PARAMETER	MEAN	STN DEV
ASYMPTOTE	0.194	0.062
SLOPE	1.457	0.516
LOG(SLOPE)	0.311	0.382
THRESHOLD	-0.020	0.842

QUADRATURE POINTS AND POSTERIOR WEIGHTS:

	1	2	3	4	5	6	7	8	9	10
POINT	-0.2666D+01	-0.2008D+01	-0.1352D+01	-0.6951D+00	-0.3875D-01	0.6179D+00	0.1274D+01	0.1931D+01	0.2588D+01	0.3244D+01
WEIGHT	0.3912D-02	0.3493D-01	0.1229D+00	0.2019D+00	0.2493D+00	0.2183D+00	0.1308D+00	0.1842D-01	0.1750D-01	0.1998D-02

EXHIBIT D-3

ITEM PARAMETER ESTIMATES FOR WORD KNOWLEDGE; 3-PARAMETER LOGISTIC MODEL

ITEM	INTERCEPT	S.E.	SLOPE	S.E.	THRESHOLD	S.E.	DISPERSN	S.E.	ASYMPTOTE	S.E.	CHISQ	DF	PROB
0001	1.935	0.165	0.910	0.114	-2.127	0.241	1.099	0.137	0.202	0.089	11.8	7.0	0.1049
0002	1.954	0.161	0.894	0.110	-2.186	0.240	1.119	0.137	0.191	0.085	5.6	7.0	0.5911
0003	1.782	0.155	1.236	0.178	-1.442	0.191	0.809	0.117	0.217	0.076	11.7	7.0	0.1084
0004	1.204	0.112	0.639	0.084	-1.885	0.295	1.566	0.206	0.190	0.084	5.9	7.0	0.5535
0005	2.045	0.158	1.009	0.111	-2.027	0.208	0.991	0.109	0.163	0.075	9.4	7.0	0.2234
0006	1.865	0.251	2.104	0.393	-0.886	0.093	0.475	0.089	0.249	0.053	19.1	7.0	0.0081
0007	1.164	0.121	0.793	0.112	-1.468	0.263	1.261	0.178	0.229	0.089	8.7	7.0	0.2748
0008	1.660	0.189	2.232	0.300	-0.744	0.083	0.448	0.060	0.302	0.052	18.3	7.0	0.0106
0009	0.399	0.096	0.983	0.130	-0.406	0.129	1.017	0.135	0.161	0.052	15.0	7.0	0.0355
0010	1.901	0.156	1.179	0.152	-1.613	0.198	0.848	0.110	0.189	0.077	10.5	7.0	0.1629
0011	0.891	0.104	1.389	0.184	-0.641	0.109	0.720	0.095	0.207	0.052	20.6	7.0	0.0045
0012	1.091	0.100	0.769	0.096	-1.419	0.221	1.301	0.163	0.157	0.070	10.7	7.0	0.1518
0013	1.190	0.134	1.479	0.226	-0.805	0.133	0.676	0.103	0.329	0.060	11.8	7.0	0.1049
0014	0.698	0.104	1.371	0.168	-0.509	0.106	0.730	0.089	0.217	0.050	24.6	7.0	0.0010
0015	1.100	0.113	1.672	0.203	-0.658	0.080	0.598	0.072	0.151	0.043	21.9	7.0	0.0028
0016	0.712	0.106	1.116	0.138	-0.638	0.137	0.896	0.111	0.233	0.057	16.4	7.0	0.0216
0017	0.868	0.109	1.933	0.227	-0.449	0.072	0.517	0.061	0.173	0.041	18.5	7.0	0.0070
0018	0.758	0.114	1.519	0.188	-0.499	0.103	0.658	0.086	0.257	0.052	26.3	7.0	0.0005
0019	0.107	0.135	1.303	0.196	-0.082	0.112	0.767	0.115	0.266	0.051	7.4	7.0	0.3891
0020	1.149	0.118	1.652	0.197	-0.696	0.091	0.605	0.072	0.194	0.049	30.0	7.0	0.0001
0021	0.494	0.130	1.486	0.257	-0.337	0.122	0.682	0.120	0.334	0.057	14.5	7.0	0.0421
0022	0.061	0.156	2.208	0.376	-0.028	0.074	0.453	0.077	0.275	0.041	12.0	7.0	0.1002
0023	-0.722	0.372	3.000	0.860	0.241	0.063	0.333	0.098	0.250	0.034	7.7	7.0	0.3625
0024	-0.881	0.270	1.658	0.339	0.531	0.081	0.603	0.123	0.335	0.037	8.9	7.0	0.2587
0025	-0.533	0.226	1.582	0.328	0.337	0.080	0.632	0.131	0.320	0.043	12.9	7.0	0.0747
0026	-0.010	0.136	1.926	0.277	0.005	0.070	0.519	0.075	0.200	0.038	23.6	7.0	0.0014
0027	-0.100	0.131	1.007	0.153	0.099	0.120	0.993	0.151	0.194	0.051	21.4	7.0	0.0033
0028	0.042	0.148	1.256	0.210	-0.034	0.122	0.796	0.133	0.267	0.056	9.6	7.0	0.2142
0029	-0.874	0.289	1.295	0.301	0.752	0.086	0.772	0.179	0.287	0.041	5.7	7.0	0.8124
0030	-0.992	0.281	1.660	0.349	0.598	0.076	0.602	0.127	0.275	0.038	2.5	7.0	0.9258
0031	1.178	0.133	1.435	0.222	-0.821	0.136	0.697	0.108	0.264	0.068	12.2	7.0	0.0936
0032	-0.907	0.302	1.161	0.300	0.781	0.113	0.861	0.223	0.300	0.047	10.7	7.0	0.1508
0033	-2.931	0.803	4.114	0.955	0.712	0.058	0.243	0.056	0.276	0.028	21.2	7.0	0.0036
0034	-0.232	0.139	1.246	0.185	0.186	0.083	0.803	0.119	0.168	0.044	28.0	7.0	0.0003
0035	-0.733	0.224	2.404	0.412	0.305	0.052	0.416	0.071	0.159	0.031	26.0	7.0	0.0006
											520.1	245.0	0.0000

PARAMETER	MEAN	STN DEV
ASYMPTOTE	0.234	0.056
SLOPE	1.531	0.679
LOG(SLOPE)	0.348	0.390
THRESHOLD	-0.510	0.853

QUADRATURE POINTS AND POSTERIOR WEIGHTS:

	1	2	3	4	5	6	7	8	9	10
POINT	-0.2617D+01	-0.2014D+01	-0.1411D+01	-0.8076D+00	-0.2043D+00	0.3990D+00	0.1002D+01	0.1605D+01	0.2209D+01	0.2812D+01
WEIGHT	0.4784D-01	0.3486D-01	0.1963D-01	0.1589D+00	0.1967D+00	0.3079D+00	0.1828D+00	0.4510D-01	0.5030D-02	0.2708D-03

EXHIBIT D-4

ITEM PARAMETER ESTIMATES FOR PARAGRAPH COMPREHENSION; 3-PARAMETER LOGISTIC MODEL

ITEM	INTERCEPT	S.E.	SLOPE	S.E.	THRESHOLD	S.E.	DISPERSN	S.E.	ASYMPTOTE	S.E.	CHISQ	DF	PROB
0001	0.638	0.149	1.155	0.230	-0.552	0.208	0.866	0.172	0.296	0.079	15.8	6.0	0.0162
0002	1.382	0.135	0.857	0.116	-1.624	0.229	1.167	0.157	0.203	0.089	10.3	6.0	0.1111
0003	1.558	0.199	1.994	0.430	-0.781	0.146	0.501	0.108	0.252	0.068	18.5	6.0	0.0053
0004	0.412	0.145	0.840	0.160	-0.490	0.242	1.190	0.226	0.242	0.084	20.9	6.0	0.0020
0005	0.575	0.103	1.240	0.178	-0.464	0.124	0.806	0.116	0.127	0.051	17.9	6.0	0.0067
0006	0.257	0.174	1.033	0.248	-0.249	0.216	0.968	0.232	0.308	0.076	16.6	6.0	0.0111
0007	0.516	0.125	0.826	0.136	-0.623	0.223	1.211	0.199	0.201	0.080	7.4	6.0	0.2824
0008	0.693	0.113	0.625	0.096	-1.109	0.278	1.600	0.245	0.196	0.086	9.8	6.0	0.1332
0009	0.676	0.119	1.122	0.184	-0.603	0.170	0.891	0.146	0.188	0.071	14.4	6.0	0.0253
0010	-0.306	0.184	1.382	0.335	0.221	0.090	0.724	0.176	0.152	0.041	24.4	6.0	0.0005
0011	0.482	0.117	0.511	0.089	-0.943	0.325	1.957	0.339	0.196	0.086	14.2	6.0	0.0269
0012	-0.202	0.203	1.272	0.339	0.159	0.125	0.786	0.210	0.228	0.052	28.9	6.0	0.0001
0013	0.767	0.118	1.008	0.155	-0.761	0.189	0.992	0.153	0.186	0.076	8.4	6.0	0.2089
0014	0.215	0.139	0.840	0.162	-0.256	0.202	1.191	0.230	0.191	0.072	16.2	6.0	0.0131
0015	-0.324	0.158	0.181	0.065	1.787	0.871	5.512	1.976	0.186	0.075	163.7	6.0	0.0000
											387.2	90.0	0.0000

PARAMETER	MEAN	STN DEV
ASYMPTOTE	0.210	0.048
SLOPE	0.993	0.419
LOG(SLOPE)	-0.118	0.549
THRESHOLD	-0.419	0.766

QUADRATURE POINTS AND POSTERIOR WEIGHTS:

	1	2	3	4	5	6	7	8	9	10
POINT	-0.4060D+01	-0.3159D+01	-0.2257D+01	-0.1356D+01	-0.4551D+00	0.4460D+00	0.1347D+01	0.2248D+01	0.3150D+01	0.4051D+01
WEIGHT	0.4815D-03	0.7111D-02	0.4278D-01	0.1349D+00	0.2083D+00	0.4796D+00	0.1054D+00	0.1948D-01	0.1773D-02	0.6739D-04

EXHIBIT D-6

ITEM PARAMETER ESTIMATES FOR AUTO AND SHOP INFORMATION; 3-PARAMETER LOGISTIC MODEL

ITEM	INTERCEPT	S.E.	SLOPE	S.E.	THRESHOLD	S.E.	DISPERSN	S.E.	ASYMPTOTE	S.E.	CHISQ	DF	PROB
0001	0.496	0.122	0.376	0.073	-1.320	0.454	2.661	0.520	0.221	0.084	4.9	7.0	0.6753
0002	0.875	0.119	0.734	0.111	-1.192	0.246	1.362	0.206	0.207	0.089	6.1	7.0	0.5339
0003	0.110	0.130	1.445	0.202	-0.076	0.095	0.692	0.097	0.204	0.051	10.3	7.0	0.1716
0004	0.939	0.125	0.677	0.117	-1.388	0.295	1.478	0.256	0.228	0.096	5.6	7.0	0.4706
0005	0.309	0.128	1.977	0.346	-0.156	0.075	0.506	0.088	0.220	0.049	11.9	7.0	0.1024
0006	-0.348	0.179	2.373	0.414	0.147	0.061	0.421	0.073	0.175	0.038	11.3	7.0	0.1232
0007	-0.776	0.241	1.641	0.291	0.473	0.089	0.609	0.108	0.255	0.039	19.8	7.0	0.0061
0008	0.125	0.133	0.412	0.078	-0.303	0.353	2.429	0.460	0.194	0.084	4.9	7.0	0.6794
0009	0.235	0.119	0.318	0.084	-0.737	0.445	3.142	0.629	0.188	0.083	16.1	7.0	0.0241
0010	-0.002	0.146	1.002	0.171	0.002	0.145	0.998	0.170	0.215	0.063	8.1	7.0	0.3234
0011	-0.253	0.198	0.706	0.153	0.358	0.228	1.417	0.307	0.253	0.075	8.4	7.0	0.2959
0012	0.052	0.129	0.478	0.084	-0.108	0.280	2.092	0.368	0.174	0.076	10.8	7.0	0.1456
0013	0.134	0.109	1.002	0.132	-0.133	0.118	0.998	0.132	0.135	0.053	9.6	7.0	0.2126
0014	-0.046	0.158	1.323	0.260	0.035	0.115	0.756	0.149	0.254	0.058	13.2	7.0	0.0678
0015	-0.428	0.174	1.227	0.209	0.349	0.104	0.815	0.139	0.195	0.047	7.3	7.0	0.3955
0016	-0.413	0.173	1.362	0.228	0.303	0.096	0.734	0.123	0.195	0.046	7.9	7.0	0.3447
0017	-1.424	0.361	2.254	0.490	0.632	0.063	0.444	0.096	0.196	0.028	8.5	7.0	0.2895
0018	-1.819	0.436	2.819	0.626	0.645	0.057	0.355	0.079	0.218	0.024	7.8	7.0	0.3528
0019	0.295	0.084	0.574	0.078	-0.513	0.197	1.741	0.237	0.130	0.060	20.5	7.0	0.0046
0020	-0.438	0.191	0.972	0.179	0.450	0.142	1.029	0.190	0.222	0.055	8.2	7.0	0.3126
0021	-0.915	0.268	0.900	0.197	1.017	0.147	1.111	0.243	0.225	0.046	6.5	7.0	0.4847
0022	-1.120	0.266	1.811	0.314	0.619	0.071	0.552	0.096	0.178	0.030	18.0	7.0	0.0120
0023	-1.420	0.235	2.099	0.317	0.677	0.051	0.476	0.072	0.063	0.018	16.7	7.0	0.0195
0024	-1.798	0.412	1.541	0.333	1.167	0.088	0.649	0.140	0.159	0.025	9.8	7.0	0.1974
0025	-0.684	0.246	0.549	0.139	1.265	0.253	1.822	0.463	0.196	0.064	2.2	7.0	0.9484
											255.5	175.0	0.0001

PARAMETER	MEAN	STN DEV
ASYMPTOTE	0.196	0.042
SLOPE	1.223	0.697
LOG(SLOPE)	0.029	0.621
THRESHOLD	0.088	0.716

QUADRATURE POINTS AND POSTERIOR WEIGHTS:

	1	2	3	4	5	6	7	8	9	10
POINT	-0.2848D+01	-0.2187D+01	-0.1526D+01	-0.8640D+00	-0.2024D+00	0.4892D+00	0.1121D+01	0.1782D+01	0.2444D+01	0.3106D+01
WEIGHT	0.8179D-02	0.3823D-01	0.7460D-01	0.1122D+00	0.3569D+00	0.2198D+00	0.1098D+00	0.6272D-01	0.1667D-01	0.2232D-03

EXHIBIT D-6

ITEM PARAMETER ESTIMATES FOR MATHEMATICS KNOWLEDGE; 3-PARAMETER LOGISTIC MODEL

ITEM	INTERCEPT	S.E.	SLOPE	S.E.	THRESHOLD	S.E.	DISPERSN	S.E.	ASYMPTOTE	S.E.	CHISQ	DF	PROB
0001	1.658	0.188	1.412	0.228	-1.175	0.158	0.708	0.114	0.197	0.086	35.3	7.0	0.0000
0002	0.782	0.112	0.841	0.113	-0.930	0.192	1.189	0.160	0.179	0.079	19.1	7.0	0.0081
0003	0.115	0.114	1.212	0.162	-0.085	0.102	0.825	0.111	0.135	0.049	6.0	7.0	0.5422
0004	0.312	0.151	1.500	0.215	-0.208	0.118	0.667	0.096	0.290	0.057	13.0	7.0	0.0712
0005	0.532	0.112	0.610	0.084	-0.871	0.244	1.638	0.225	0.181	0.080	11.9	7.0	0.1015
0006	-0.188	0.146	1.637	0.230	0.101	0.080	0.611	0.086	0.178	0.041	10.0	7.0	0.1869
0007	-0.192	0.222	2.201	0.465	0.087	0.088	0.454	0.096	0.321	0.045	9.3	7.0	0.2326
0008	0.008	0.119	0.908	0.124	-0.010	0.132	1.101	0.151	0.139	0.054	7.2	7.0	0.4129
0009	0.015	0.170	1.446	0.246	-0.010	0.119	0.691	0.119	0.305	0.054	5.1	7.0	0.6450
0010	-0.081	0.162	1.090	0.208	0.074	0.139	0.918	0.175	0.225	0.061	19.0	7.0	0.0082
0011	-0.582	0.247	1.031	0.232	0.565	0.146	0.970	0.218	0.309	0.053	6.2	7.0	0.5160
0012	-0.584	0.166	1.671	0.235	0.349	0.066	0.598	0.084	0.133	0.031	15.4	7.0	0.0309
0013	-0.911	0.328	3.383	0.600	0.269	0.057	0.296	0.052	0.198	0.026	24.9	7.0	0.0009
0014	-1.154	0.268	2.336	0.417	0.494	0.050	0.428	0.076	0.159	0.026	7.4	7.0	0.3837
0015	-1.045	0.301	0.949	0.231	1.100	0.135	1.054	0.256	0.234	0.042	9.4	7.0	0.2223
0016	-1.375	0.411	2.944	0.720	0.467	0.050	0.340	0.083	0.309	0.028	4.3	7.0	0.7514
0017	-0.924	0.203	1.986	0.285	0.465	0.055	0.503	0.072	0.119	0.025	14.0	7.0	0.0503
0018	-1.299	0.337	2.978	0.600	0.436	0.044	0.336	0.068	0.211	0.025	7.4	7.0	0.3843
0019	-0.642	0.229	1.428	0.249	0.450	0.102	0.700	0.122	0.295	0.041	20.1	7.0	0.0056
0020	-1.002	0.292	1.356	0.300	0.739	0.095	0.738	0.163	0.262	0.038	10.4	7.0	0.1640
0021	-2.137	0.583	2.204	0.536	0.970	0.072	0.454	0.110	0.280	0.026	10.2	7.0	0.1772
0022	-2.715	0.614	3.101	0.598	0.876	0.055	0.323	0.062	0.180	0.021	3.8	7.0	0.7987
0023	-2.114	0.372	2.316	0.375	0.913	0.052	0.432	0.070	0.120	0.018	13.8	7.0	0.0537
0024	-1.337	0.257	1.182	0.215	1.132	0.091	0.846	0.154	0.127	0.026	9.5	7.0	0.2150
0025	-2.177	0.457	2.369	0.452	0.919	0.057	0.422	0.080	0.152	0.021	12.8	7.0	0.0769
											305.8	175.0	0.0000

PARAMETER	MEAN	STN DEV
ASYMPTOTE	0.209	0.068
SLOPE	1.764	0.778
LOG(SLOPE)	0.471	0.455
THRESHOLD	0.284	0.615

QUADRATURE POINTS AND POSTERIOR WEIGHTS:

	1	2	3	4	5	6	7	8	9	10
POINT	-0.2865D+01	-0.2200D+01	-0.1537D+01	-0.8720D+00	-0.2079D+00	0.4563D+00	0.1120D+01	0.1785D+01	0.2448D+01	0.3113D+01
WEIGHT	0.3099D-02	0.3214D-01	0.9046D-01	0.1350D+00	0.2791D+00	0.2577D+00	0.1436D+00	0.4105D-01	0.1706D-01	0.7161D-03

EXHIBIT D-7

ITEM PARAMETER ESTIMATES FOR MECHANICAL REASONING; 3-PARAMETER LOGISTIC MODEL

ITEM	INTERCEPT	S.E.	SLOPE	S.E.	THRESHOLD	S.E.	DISPERSN	S.E.	ASYMPTOTE	S.E.	CHISQ	DF	PROB
0001	1.162	0.125	0.573	0.101	-2.030	0.357	1.746	0.307	0.218	0.094	20.5	7.0	0.0047
0002	0.777	0.136	1.077	0.189	-0.721	0.192	0.928	0.163	0.232	0.389	18.4	7.0	0.0105
0003	0.756	0.116	0.729	0.102	-1.037	0.226	1.372	0.193	0.194	0.085	6.2	7.0	0.5144
0004	-0.965	0.252	1.097	0.217	0.880	0.106	0.912	0.181	0.198	0.037	5.5	7.0	0.5996
0005	0.005	0.122	0.882	0.122	-0.006	0.139	1.134	0.157	0.137	0.055	4.8	7.0	0.6848
0006	-1.517	0.483	1.602	0.409	0.946	0.118	0.624	0.159	0.477	0.031	5.9	7.0	0.5499
0007	-0.650	0.281	1.462	0.342	0.445	0.111	0.684	0.160	0.334	0.044	4.9	7.0	0.6776
0008	0.286	0.115	1.202	0.152	-0.238	0.112	0.832	0.105	0.139	0.053	15.9	7.0	0.0262
0009	0.269	0.121	0.586	0.087	-0.459	0.245	1.707	0.253	0.178	0.077	8.7	7.0	0.2770
0010	0.118	0.120	1.497	0.164	-0.079	0.085	0.668	0.073	0.126	0.040	24.9	7.0	0.0009
0011	0.181	0.148	0.483	0.089	-0.374	0.348	2.071	0.380	0.226	0.092	2.6	7.0	0.9211
0012	-0.426	0.217	1.521	0.279	0.280	0.104	0.657	0.121	0.264	0.044	13.0	7.0	0.0706
0013	-0.085	0.197	1.369	0.269	0.062	0.135	0.731	0.143	0.300	0.057	6.8	7.0	0.4529
0014	-0.245	0.183	1.292	0.219	0.190	0.118	0.774	0.131	0.227	0.050	9.6	7.0	0.2088
0015	-0.066	0.134	0.917	0.136	0.072	0.139	1.091	0.161	0.150	0.056	2.6	7.0	0.9189
0016	-0.020	0.144	0.578	0.101	0.035	0.245	1.730	0.302	0.180	0.075	4.1	7.0	0.7658
0017	-1.104	0.313	1.382	0.288	0.793	0.104	0.718	0.149	0.325	0.035	9.4	7.0	0.2269
0018	-0.971	0.271	1.684	0.321	0.577	0.079	0.594	0.113	0.257	0.032	18.4	7.0	0.0313
0019	-3.332	1.275	2.551	0.917	1.306	0.073	0.392	0.141	0.342	0.022	8.1	7.0	0.3234
0020	-0.364	0.197	0.817	0.164	0.445	0.176	1.223	0.246	0.211	0.063	5.3	7.0	0.6239
0021	-1.405	0.327	1.747	0.342	0.804	0.078	0.572	0.112	0.255	0.029	11.3	7.0	0.1233
0022	-1.661	0.467	1.303	0.347	1.274	0.110	0.767	0.204	0.275	0.031	5.6	7.0	0.4749
0023	-0.995	0.223	1.273	0.222	0.782	0.083	0.788	0.137	0.124	0.031	12.1	7.0	0.0963
0024	-0.739	0.237	0.891	0.191	0.830	0.139	1.123	0.241	0.189	0.049	5.5	7.0	0.5961
0025	-1.200	0.264	1.420	0.252	0.846	0.081	0.704	0.125	0.167	0.029	6.2	7.0	0.5136
											234.4	175.0	0.0018

PARAMETER	MEAN	STN DEV
ASYMPTOTE	0.229	0.082
SLOPE	1.198	0.468
LOG(SLOPE)	0.103	0.412
THRESHOLD	0.225	0.764

QUADRATURE POINTS AND POSTERIOR WEIGHTS:

	1	2	3	4	5	6	7	8	9	10
POINT	-0.3749D+01	-0.2893D+01	-0.2036D+01	-0.1179D+01	-0.3232D+00	0.5333D+00	0.1390D+01	0.2247D+01	0.3102D+01	0.3959D+01
WEIGHT	0.1748D-03	0.4923D-02	0.5228D-01	0.1664D+00	0.3036D+00	0.3020D+00	0.1544D+00	0.1552D-01	0.8033D-03	0.2834D-04

EXHIBIT D-8

ITEM PARAMETER ESTIMATES FOR ELECTRONICS KNOWLEDGE; 3-PARAMETER LOGISTIC MODEL

ITEM	INTERCEPT	S.E.	SLOPE	S.E.	THRESHOLD	S.E.	DISPERSN	S.E.	ASYMPTOTE	S.E.	CHISQ	DF	PROB
0001	0.859	0.117	0.824	0.126	-1.042	0.211	1.213	0.185	0.197	0.086	2.9	7.0	0.8937
0002	0.287	0.173	1.654	0.354	-0.173	0.126	0.605	0.129	0.363	0.062	7.5	7.0	0.3748
0003	0.516	0.125	1.494	0.266	-0.345	0.112	0.669	0.118	0.209	0.063	3.0	7.0	0.8880
0004	0.611	0.110	1.365	0.194	-0.448	0.107	0.733	0.104	0.154	0.059	10.7	7.0	0.1496
0005	0.699	0.122	0.894	0.141	-0.782	0.198	1.119	0.176	0.208	0.086	7.0	7.0	0.4264
0006	0.376	0.118	1.377	0.203	-0.273	0.105	0.726	0.107	0.171	0.057	18.0	7.0	0.0122
0007	0.215	0.154	1.258	0.231	-0.171	0.142	0.797	0.147	0.262	0.068	9.8	7.0	0.1996
0008	0.273	0.120	0.859	0.118	-0.318	0.164	1.164	0.160	0.171	0.068	11.6	7.0	0.1138
0009	0.249	0.160	0.714	0.127	-0.349	0.263	1.400	0.249	0.264	0.092	11.1	7.0	0.1314
0010	-0.026	0.113	0.939	0.133	0.028	0.118	1.065	0.151	0.121	0.051	6.4	7.0	0.4944
0011	-0.907	0.320	0.853	0.238	1.063	0.177	1.172	0.327	0.277	0.052	10.8	7.0	0.1488
0012	-0.631	0.219	1.407	0.287	0.448	0.091	0.711	0.145	0.192	0.041	12.8	7.0	0.0762
0013	-0.610	0.192	1.028	0.203	0.595	0.112	0.975	0.193	0.147	0.046	8.8	7.0	0.2683
0014	-0.248	0.163	0.396	0.085	0.625	0.344	2.524	0.543	0.181	0.076	14.9	7.0	0.0374
0015	-0.647	0.198	1.319	0.248	0.490	0.088	0.758	0.142	0.150	0.039	11.8	7.0	0.1057
0016	-0.671	0.224	0.929	0.198	0.723	0.138	1.077	0.230	0.186	0.051	12.9	7.0	0.0733
0017	-2.140	0.750	0.774	0.364	2.764	0.529	1.292	0.608	0.234	0.028	6.5	7.0	0.4866
0018	-0.452	0.150	0.734	0.127	0.615	0.146	1.362	0.236	0.121	0.050	8.8	7.0	0.2651
0019	-0.689	0.240	1.037	0.241	0.664	0.125	0.964	0.224	0.200	0.050	5.6	7.0	0.5897
0020	-1.587	0.396	1.392	0.350	1.140	0.102	0.718	0.181	0.166	0.028	9.0	7.0	0.2512
											180.0	140.0	0.0032

PARAMETER	MEAN	STN DEV
ASYMPTOTE	0.199	0.058
SLOPE	1.062	0.326
LOG(SLOPE)	0.010	0.341
THRESHOLD	0.263	0.846

QUADRATURE POINTS AND POSTERIOR WEIGHTS:

	1	2	3	4	5	6	7	8	9	10
POINT	-0.3603D+01	-0.2795D+01	-0.1986D+01	-0.1177D+01	-0.3680D+00	0.4408D+00	0.1250D+01	0.2059D+01	0.2867D+01	0.3676D+01
WEIGHT	0.3378D-03	0.6650D-02	0.4692D-01	0.1401D+00	0.3427D+00	0.2916D+00	0.1194D+00	0.3931D-01	0.1213D-01	0.8019D-03

APPENDIX E

ITEM INFORMATION INDICES, 1-PARAMETER LOGISTIC MODEL

EXHIBIT E-1

ITEM INFORMATION STATISTICS FOR SUBTEST GENERAL SCIENCE; 1-PARAMETER LOGISTIC MODEL

ITEM	MAXIMUM INFORMATION	STANDARD ERROR	POINT OF MAX INFORMATION	STANDARD ERROR	MAXIMUM EFFECTIVENESS	POINT OF MAX EFFECTVNESS	AVERAGE INFORMATION	INDEX OF RELIABILITY
0001:	0.3087	0.0133	-2.3360	0.1325	0.0338	-0.0651	0.1017	0.0923
0002:	0.3087	0.0133	-1.5081	0.0981	0.0703	-0.1041	0.1684	0.1441
0003:	0.3087	0.0133	-1.4374	0.0987	0.0740	-0.1056	0.1742	0.1484
0004:	0.3087	0.0133	-1.1468	0.0868	0.0892	-0.1055	0.1974	0.1648
0005:	0.3087	0.0133	-1.3586	0.0936	0.0781	-0.1067	0.1807	0.1530
0006:	0.3087	0.0133	-1.6855	0.1073	0.0612	-0.0982	0.1535	0.1331
0007:	0.3087	0.0133	-1.0595	0.0855	0.0935	-0.1032	0.2038	0.1693
0008:	0.3087	0.0133	-1.7679	0.1038	0.0672	-0.0947	0.1656	0.1278
0009:	0.3087	0.0133	-1.3934	0.0947	0.0763	-0.1063	0.1778	0.1510
0010:	0.3087	0.0133	-1.3136	0.0923	0.0805	-0.1069	0.1843	0.1556
0011:	0.3087	0.0133	-1.0774	0.0875	0.0926	-0.1037	0.2025	0.1684
0012:	0.3087	0.0133	-0.1166	0.0710	0.1228	-0.0154	0.2461	0.1975
0013:	0.3087	0.0133	-0.1511	0.0761	0.1225	-0.0201	0.2457	0.1972
0014:	0.3087	0.0133	-0.7301	0.0788	0.1082	-0.0843	0.2252	0.1838
0015:	0.3087	0.0133	-0.9851	0.0806	0.0971	-0.1003	0.2091	0.1725
0016:	0.3087	0.0133	-0.8987	0.0811	0.1011	-0.0959	0.2149	0.1769
0017:	0.3087	0.0133	-0.7271	0.0771	0.1083	-0.0841	0.2253	0.1838
0018:	0.3087	0.0133	0.2574	0.0783	0.1212	0.0338	0.2438	0.1960
0019:	0.3087	0.0133	0.0078	0.0730	0.1232	0.0010	0.2466	0.1978
0020:	0.3087	0.0133	-0.1001	0.0749	0.1229	-0.0133	0.2462	0.1976
0021:	0.3087	0.0133	0.5101	0.0765	0.1156	0.0636	0.2359	0.1908
0022:	0.3087	0.0133	0.5508	0.0759	0.1144	0.0678	0.2341	0.1897
0023:	0.3087	0.0133	0.6019	0.0765	0.1128	0.0729	0.2318	0.1882
0024:	0.3087	0.0133	1.2485	0.0938	0.0839	0.1068	0.1895	0.1593
0025:	0.3087	0.0133	0.8495	0.0784	0.1145	0.0677	0.2342	0.1898

EXHIBIT E-2

ITEM INFORMATION STATISTICS FOR SUBTEST ARITHMETIC REASONING; 1-PARAMETER LOGISTIC MODEL

ITEM	MAXIMUM INFORMATION	STANDARD ERROR	POINT OF MAX INFORMATION	STANDARD ERROR	MAXIMUM EFFECTIVENESS	POINT OF MAX EFFECTVNESS	AVERAGE INFORMATION	INDEX OF RELIABILITY
0001:	0.5342	0.0164	-2.0211	0.0848	0.0438	-0.0682	0.1544	0.1337
0002:	0.5342	0.0164	-2.0841	0.1011	0.0395	-0.0622	0.1448	0.1265
0003:	0.5342	0.0164	-1.0723	0.0718	0.1370	-0.1405	0.2940	0.2272
0004:	0.5342	0.0164	-0.9095	0.0693	0.1560	-0.1380	0.3163	0.2403
0005:	0.5342	0.0164	-0.5945	0.0633	0.1873	-0.1099	0.3524	0.2606
0006:	0.5342	0.0164	-0.8477	0.0654	0.1628	-0.1348	0.3242	0.2448
0007:	0.5342	0.0164	-1.1013	0.0643	0.1335	-0.1402	0.2898	0.2247
0008:	0.5342	0.0164	-0.9343	0.0660	0.1532	-0.1389	0.3130	0.2384
0009:	0.5342	0.0164	-0.8130	0.0650	0.1665	-0.1325	0.3285	0.2472
0010:	0.5342	0.0164	-0.7370	0.0647	0.1743	-0.1262	0.3374	0.2523
0011:	0.5342	0.0164	-0.5292	0.0684	0.1925	-0.1007	0.3584	0.2638
0012:	0.5342	0.0164	-0.3870	0.0614	0.2036	-0.0719	0.3712	0.2707
0013:	0.5342	0.0164	-0.4237	0.0586	0.1998	-0.0837	0.3667	0.2683
0014:	0.5342	0.0164	-0.3378	0.0635	0.2046	-0.0684	0.3723	0.2713
0015:	0.5342	0.0164	-0.5021	0.0639	0.1945	-0.0965	0.3607	0.2651
0016:	0.5342	0.0164	-0.3669	0.0573	0.2030	-0.0737	0.3706	0.2704
0017:	0.5342	0.0164	-0.1088	0.0572	0.2122	-0.0228	0.3812	0.2760
0018:	0.5342	0.0164	-0.0816	0.0575	0.2129	-0.0108	0.3820	0.2764
0019:	0.5342	0.0164	-0.2432	0.0576	0.2086	-0.0502	0.3770	0.2738
0020:	0.5342	0.0164	0.4609	0.0657	0.1968	0.0912	0.3634	0.2665
0021:	0.5342	0.0164	0.2913	0.0615	0.2067	0.0596	0.3748	0.2726
0022:	0.5342	0.0164	-0.1878	0.0602	0.2104	-0.0390	0.3791	0.2749
0023:	0.5342	0.0164	-0.1174	0.0576	0.2121	-0.0246	0.3810	0.2759
0024:	0.5342	0.0164	0.2014	0.0633	0.2100	0.0418	0.3787	0.2747
0025:	0.5342	0.0164	0.1029	0.0605	0.2123	0.0216	0.3813	0.2760
0026:	0.5342	0.0164	0.0950	0.0606	0.2124	0.0200	0.3814	0.2761
0027:	0.5342	0.0164	0.3243	0.0654	0.2062	0.0658	0.3731	0.2717
0028:	0.5342	0.0164	0.6704	0.0654	0.1807	0.1193	0.3447	0.2563
0029:	0.5342	0.0164	0.7239	0.0679	0.1756	0.1250	0.3389	0.2531
0030:	0.5342	0.0164	0.1367	0.0628	0.2117	0.0286	0.3806	0.2757

EXHIBIT E-3

ITEM INFORMATION STATISTICS FOR SUBTEST WORD KNOWLEDGE; 1-PARAMETER LOGISTIC MODEL

ITEM	MAXIMUM INFORMATION	STANDARD ERROR	POINT OF MAX INFORMATION	STANDARD ERROR	MAXIMUM EFFECTIVENESS	POINT OF MAX EFFECTVNESS	AVERAGE INFORMATION	INDEX OF RELIABILITY
0001:	0.5565	0.0148	-2.2823	0.1125	0.0295	-0.0488	0.1228	0.1094
0002:	0.5565	0.0148	-2.3034	0.1146	0.0286	-0.0474	0.1203	0.1074
0003:	0.5565	0.0148	-1.9357	0.0994	0.0488	-0.0741	0.1684	0.1441
0004:	0.5565	0.0148	-1.7462	0.0832	0.0636	-0.0906	0.1964	0.1642
0005:	0.5565	0.0148	-2.2291	0.1111	0.0319	-0.0525	0.1293	0.1145
0006:	0.5565	0.0148	-1.6644	0.0912	0.0711	-0.0989	0.2080	0.1729
0007:	0.5565	0.0148	-1.6815	0.0832	0.0695	-0.0972	0.2063	0.1710
0008:	0.5565	0.0148	-1.5998	0.0897	0.0774	-0.1056	0.2191	0.1797
0009:	0.5565	0.0148	-0.7663	0.0637	0.1774	-0.1324	0.3438	0.2558
0010:	0.5565	0.0148	-2.0165	0.1036	0.0434	-0.0668	0.1571	0.1357
0011:	0.5566	0.0148	-1.2019	0.0762	0.1241	-0.1389	0.2820	0.2200
0012:	0.5565	0.0148	-1.5166	0.0783	0.0862	-0.1140	0.2322	0.1885
0013:	0.5565	0.0148	-1.5909	0.0842	0.0784	-0.1065	0.2205	0.1806
0014:	0.5565	0.0148	-1.0755	0.0712	0.1402	-0.1432	0.3013	0.2315
0015:	0.5565	0.0148	-1.1933	0.0790	0.1252	-0.1394	0.2834	0.2208
0016:	0.5565	0.0148	-1.1545	0.0706	0.1301	-0.1411	0.2893	0.2244
0017:	0.5565	0.0148	-1.0247	0.0751	0.1467	-0.1436	0.3088	0.2389
0018:	0.5565	0.0148	-1.1522	0.0743	0.1304	-0.1411	0.2897	0.2246
0019:	0.5565	0.0148	-0.8970	0.0623	0.1646	-0.1257	0.3520	0.2603
0020:	0.5565	0.0148	-1.3008	0.0801	0.1116	-0.1328	0.2665	0.2104
0021:	0.5565	0.0148	-1.1071	0.0699	0.1362	-0.1426	0.2966	0.2287
0022:	0.5565	0.0148	-0.7231	0.0660	0.1820	-0.1284	0.3490	0.2687
0023:	0.5565	0.0148	-0.3746	0.0638	0.2108	-0.0775	0.3816	0.2762
0024:	0.5565	0.0148	-0.2439	0.0550	0.2172	-0.0520	0.3869	0.2800
0025:	0.5565	0.0148	-0.3919	0.0576	0.2098	-0.0807	0.3804	0.2756
0026:	0.5565	0.0148	-0.5271	0.0654	0.2001	-0.1034	0.3695	0.2698
0027:	0.5565	0.0148	-0.3419	0.0584	0.2127	-0.0713	0.3837	0.2773
0028:	0.5565	0.0148	-0.6392	0.0620	0.1903	-0.1190	0.3584	0.2638
0029:	0.5565	0.0148	0.0775	0.0548	0.2215	0.0168	0.3939	0.2826
0030:	0.5565	0.0148	0.0024	0.0570	0.2220	0.0005	0.3944	0.2829
0031:	0.5565	0.0148	-1.5183	0.0681	0.0861	-0.1138	0.2319	0.1883
0032:	0.5565	0.0148	0.0492	0.0544	0.2218	0.0107	0.3942	0.2827
0033:	0.5565	0.0148	0.2271	0.0582	0.2178	0.0485	0.3897	0.2804
0034:	0.5565	0.0148	-0.2069	0.0613	0.2185	-0.0444	0.3905	0.2808
0035:	0.5565	0.0148	-0.0767	0.0650	0.2218	-0.0167	0.3939	0.2826

EXHIBIT E-4

ITEM INFORMATION STATISTICS FOR SUBTEST PARAGRAPH COMPREHENSION; 1-PARAMETER LOGISTIC MODEL

ITEM	MAXIMUM INFORMATION	STANDARD ERROR	POINT OF MAX INFORMATION	STANDARD ERROR	MAXIMUM EFFECTIVENESS	POINT OF MAX EFFECTVNESS	AVERAGE INFORMATION	INDEX OF RELIABILITY
0001:	0.3343	0.0168	-1.3611	0.0952	0.0818	-0.1104	0.1898	0.1595
0002:	0.3343	0.0168	-2.1485	0.1223	0.0406	-0.0736	0.1192	0.1065
0003:	0.3343	0.0168	-1.7091	0.1129	0.0618	-0.0984	0.1581	0.1385
0004:	0.3343	0.0168	-1.0613	0.0848	0.0993	-0.1085	0.2155	0.1773
0005:	0.3343	0.0168	-0.9485	0.0894	0.1054	-0.1041	0.2243	0.1832
0006:	0.3343	0.0168	-1.0314	0.0845	0.1009	-0.1075	0.2179	0.1789
0007:	0.3343	0.0168	-1.1035	0.0869	0.0969	-0.1096	0.2121	0.1750
0008:	0.3343	0.0168	-1.3860	0.0918	0.0803	-0.1100	0.1876	0.1580
0009:	0.3343	0.0168	-1.1868	0.0930	0.0921	-0.1110	0.2051	0.1702
0010:	0.3343	0.0168	-0.1536	0.0762	0.1328	-0.0219	0.2622	0.2077
0011:	0.3343	0.0168	-1.1220	0.0831	0.0958	-0.1100	0.2105	0.1739
0012:	0.3343	0.0168	-0.4171	0.0763	0.1275	-0.0568	0.2552	0.2033
0013:	0.3343	0.0168	-1.3064	0.0966	0.0850	-0.1110	0.1947	0.1630
0014:	0.3343	0.0168	-0.7144	0.0811	0.1168	-0.0882	0.2403	0.1938
0015:	0.3343	0.0168	0.1186	0.0654	0.1329	0.0169	0.2627	0.2080

EXHIBIT E-5

ITEM INFORMATION STATISTICS FOR SUBTEST AUTO AND SHOP INFORMATION; 1-PARAMETER LOGISTIC MODEL

ITEM	MAXIMUM INFORMATION	STANDARD ERROR	POINT OF MAX INFORMATION	STANDARD ERROR	MAXIMUM EFFECTIVENESS	POINT OF MAX EFFECTVNESS	AVERAGE INFORMATION	INDEX OF RELIABILITY
0001:	0.3274	0.0135	-1.2349	0.0814	0.0880	-0.1101	0.1982	0.1654
0002:	0.3274	0.0135	-1.5745	0.0942	0.0687	-0.1038	0.1684	0.1441
0003:	0.3274	0.0135	-0.5963	0.0776	0.1193	-0.0758	0.2430	0.1955
0004:	0.3274	0.0135	-1.7199	0.0981	0.0608	-0.0976	0.1554	0.1346
0005:	0.3274	0.0135	-0.7573	0.0805	0.1128	-0.0904	0.2339	0.1895
0006:	0.3274	0.0135	-0.1939	0.0785	0.1294	-0.0270	0.2571	0.2045
0007:	0.3274	0.0135	-0.0742	0.0736	0.1304	-0.0104	0.2586	0.2055
0008:	0.3274	0.0135	-0.6517	0.0711	0.1172	-0.0812	0.2401	0.1936
0009:	0.3274	0.0135	-0.7991	0.0721	0.1109	-0.0835	0.2312	0.1878
0010:	0.3274	0.0135	-0.5205	0.0747	0.1219	-0.0678	0.2467	0.1979
0011:	0.3274	0.0135	-0.3231	0.0702	0.1272	-0.0441	0.2541	0.2026
0012:	0.3274	0.0135	-0.4987	0.0704	0.1226	-0.0654	0.2477	0.1985
0013:	0.3274	0.0135	-0.4938	0.0757	0.1228	-0.0649	0.2479	0.1986
0014:	0.3274	0.0135	-0.5774	0.0766	0.1200	-0.0739	0.2440	0.1961
0015:	0.3274	0.0135	-0.0861	0.0739	0.1303	-0.0121	0.2585	0.2054
0016:	0.3274	0.0135	-0.1075	0.0756	0.1302	-0.0151	0.2583	0.2053
0017:	0.3274	0.0135	0.3587	0.0789	0.1264	0.0487	0.2530	0.2019
0018:	0.3274	0.0135	0.3331	0.0781	0.1270	0.0454	0.2538	0.2024
0019:	0.3274	0.0135	-0.7331	0.0751	0.1139	-0.0884	0.2354	0.1905
0020:	0.3274	0.0135	-0.1001	0.0719	0.1303	-0.0140	0.2584	0.2053
0021:	0.3274	0.0135	0.3410	0.0719	0.1268	0.0464	0.2536	0.2023
0022:	0.3274	0.0135	0.3525	0.0788	0.1266	0.0479	0.2532	0.2020
0023:	0.3274	0.0135	0.8783	0.0831	0.1072	0.0988	0.2259	0.1843
0024:	0.3274	0.0135	0.9365	0.0842	0.1043	0.1020	0.2218	0.1816
0025:	0.3274	0.0135	0.3640	0.0705	0.1283	0.0493	0.2528	0.2018

EXHIBIT E-6

ITEM INFORMATION STATISTICS FOR SUBTEST MATHEMATICS KNOWLEDGE; 1-PARAMETER LOGISTIC MODEL

ITEM	MAXIMUM INFORMATION	STANDARD ERROR	POINT OF MAX INFORMATION	STANDARD ERROR	MAXIMUM EFFECTIVENESS	POINT OF MAX EFFECTVNESS	AVERAGE INFORMATION	INDEX OF RELIABILITY
0001:	0.4979	0.0180	-1.6700	0.0886	0.0702	-0.1007	0.1976	0.1650
0002:	0.4979	0.0180	-1.1866	0.0715	0.1188	-0.1340	0.2656	0.2099
0003:	0.4979	0.0180	-0.4383	0.0633	0.1859	-0.0818	0.3468	0.2575
0004:	0.4979	0.0180	-0.8375	0.0671	0.1549	-0.1283	0.3099	0.2366
0005:	0.4979	0.0180	-1.0073	0.0661	0.1377	-0.1353	0.2893	0.2244
0006:	0.4979	0.0180	-0.3157	0.0640	0.1920	-0.0508	0.3541	0.2615
0007:	0.4979	0.0180	-0.6171	0.0648	0.1740	-0.1072	0.3326	0.2496
0008:	0.4979	0.0180	-0.3452	0.0599	0.1907	-0.0660	0.3525	0.2606
0009:	0.4979	0.0180	-0.6835	0.0643	0.1687	-0.1149	0.3263	0.2461
0010:	0.4979	0.0180	-0.4471	0.0610	0.1854	-0.0831	0.3463	0.2572
0011:	0.4979	0.0180	-0.2384	0.0569	0.1948	-0.0466	0.3575	0.2633
0012:	0.4979	0.0180	0.0618	0.0547	0.1984	0.0123	0.3617	0.2656
0013:	0.4979	0.0180	-0.1597	0.0663	0.1969	-0.0316	0.3600	0.2647
0014:	0.4979	0.0180	0.1951	0.0672	0.1961	0.0384	0.3590	0.2641
0015:	0.4979	0.0180	0.3190	0.0569	0.1918	0.0614	0.3539	0.2614
0016:	0.4979	0.0180	-0.1848	0.0624	0.1963	-0.0364	0.3593	0.2643
0017:	0.4979	0.0180	0.2626	0.0676	0.1940	0.0511	0.3565	0.2628
0018:	0.4979	0.0180	0.0125	0.0653	0.1986	0.0025	0.3620	0.2658
0019:	0.4979	0.0180	-0.2487	0.0599	0.1945	-0.0487	0.3570	0.2631
0020:	0.4979	0.0180	0.0729	0.0590	0.1983	0.0145	0.3616	0.2656
0021:	0.4979	0.0180	0.2983	0.0592	0.1926	0.0578	0.3549	0.2619
0022:	0.4979	0.0180	0.5958	0.0690	0.1756	0.1045	0.3345	0.2507
0023:	0.4979	0.0180	0.7976	0.0737	0.1586	0.1254	0.3144	0.2392
0024:	0.4979	0.0180	0.7950	0.0670	0.1589	0.1252	0.3147	0.2394
0025:	0.4979	0.0180	0.6807	0.0711	0.1689	0.1146	0.3286	0.2462

EXHIBIT E-7

ITEM INFORMATION STATISTICS FOR SUBTEST MECHANICAL REASONING; 1-PARAMETER LOGISTIC MODEL

ITEM	MAXIMUM INFORMATION	STANDARD ERROR	POINT OF MAX INFORMATION	STANDARD ERROR	MAXIMUM EFFECTIVENESS	POINT OF MAX EFFECTVNESS	AVERAGE INFORMATION	INDEX OF RELIABILITY
0001:	0.2809	0.0120	-2.2077	0.1198	0.0382	-0.0735	0.1075	0.0970
0002:	0.2809	0.0120	-1.4062	0.0973	0.0715	-0.1018	0.1565	0.1427
0003:	0.2809	0.0120	-1.4770	0.0963	0.0683	-0.1011	0.1613	0.1389
0004:	0.2809	0.0120	0.4054	0.0791	0.1080	0.0479	0.2220	0.1817
0005:	0.2809	0.0120	-0.3578	0.0800	0.1089	-0.0427	0.2233	0.1826
0006:	0.2809	0.0120	-0.4794	0.0748	0.1064	-0.0557	0.2196	0.1801
0007:	0.2809	0.0120	-0.3975	0.0790	0.1082	-0.0470	0.2222	0.1818
0008:	0.2809	0.0120	-0.6572	0.0861	0.1017	-0.0724	0.2126	0.1753
0009:	0.2809	0.0120	-0.8222	0.0816	0.0962	-0.0850	0.2044	0.1697
0010:	0.2809	0.0120	-0.4422	0.0855	0.1073	-0.0518	0.2209	0.1809
0011:	0.2809	0.0120	-0.8089	0.0795	0.0967	-0.0841	0.2052	0.1702
0012:	0.2809	0.0120	-0.3651	0.0820	0.1088	-0.0435	0.2231	0.1824
0013:	0.2809	0.0120	-0.6989	0.0838	0.1004	-0.0759	0.2107	0.1740
0014:	0.2809	0.0120	-0.3666	0.0815	0.1087	-0.0436	0.2231	0.1824
0015:	0.2809	0.0120	-0.3099	0.0805	0.1097	-0.0373	0.2245	0.1833
0016:	0.2809	0.0120	-0.4240	0.0771	0.1076	-0.0499	0.2214	0.1813
0017:	0.2809	0.0120	-0.0504	0.0763	0.1120	-0.0062	0.2279	0.1866
0018:	0.2809	0.0120	-0.0071	0.0790	0.1121	-0.0009	0.2280	0.1867
0019:	0.2809	0.0120	0.3380	0.0734	0.1092	0.0404	0.2238	0.1829
0020:	0.2809	0.0120	-0.1125	0.0778	0.1117	-0.0138	0.2275	0.1853
0021:	0.2809	0.0120	0.2506	0.0796	0.1105	0.0304	0.2257	0.1841
0022:	0.2809	0.0120	0.4861	0.0768	0.1063	0.0564	0.2194	0.1799
0023:	0.2809	0.0120	0.6291	0.0872	0.1025	0.0700	0.2138	0.1762
0024:	0.2809	0.0120	0.3320	0.0803	0.1093	0.0398	0.2239	0.1830
0025:	0.2809	0.0120	0.5645	0.0866	0.1043	0.0641	0.2165	0.1780

EXHIBIT E-8

ITEM INFORMATION STATISTICS FOR SUBTEST ELECTRONICS KNOWLEDGE; 1-PARAMETER LOGISTIC MODEL

ITEM	MAXIMUM INFORMATION	STANDARD ERROR	POINT OF MAX INFORMATION	STANDARD ERROR	MAXIMUM EFFECTIVENESS	POINT OF MAX EFFECTVNESS	AVERAGE INFORMATION	INDEX OF RELIABILITY
0001:	0.2919	0.0142	-1.5491	0.1007	0.0863	-0.1011	0.1595	0.1376
0002:	0.2919	0.0142	-1.0686	0.0897	0.0891	-0.0998	0.1851	0.1633
0003:	0.2919	0.0142	-0.9294	0.0894	0.0952	-0.0938	0.2042	0.1695
0004:	0.2919	0.0142	-0.9417	0.0897	0.0947	-0.0945	0.2034	0.1690
0005:	0.2919	0.0142	-1.3232	0.0942	0.0772	-0.1040	0.1769	0.1503
0006:	0.2919	0.0142	-0.7300	0.0864	0.1029	-0.0807	0.2155	0.1773
0007:	0.2919	0.0142	-0.8106	0.0848	0.0998	-0.0866	0.2112	0.1744
0008:	0.2919	0.0142	-0.7227	0.0830	0.1031	-0.0801	0.2159	0.1776
0009:	0.2919	0.0142	-0.9301	0.0831	0.0951	-0.0939	0.2041	0.1695
0010:	0.2919	0.0142	-0.2300	0.0795	0.1150	-0.0289	0.2333	0.1892
0011:	0.2919	0.0142	0.2096	0.0737	0.1152	0.0264	0.2337	0.1894
0012:	0.2919	0.0142	0.1202	0.0798	0.1160	0.0183	0.2348	0.1902
0013:	0.2919	0.0142	0.3370	0.0797	0.1134	0.0417	0.2310	0.1876
0014:	0.2919	0.0142	-0.0535	0.0715	0.1163	-0.0068	0.2353	0.1905
0015:	0.2919	0.0142	0.2821	0.0813	0.1143	0.0352	0.2323	0.1885
0016:	0.2919	0.0142	0.3042	0.0780	0.1140	0.0378	0.2318	0.1882
0017:	0.2919	0.0142	1.1337	0.0817	0.0861	0.1017	0.1906	0.1601
0018:	0.2919	0.0142	0.3233	0.0784	0.1136	0.0401	0.2313	0.1879
0019:	0.2919	0.0142	0.2406	0.0785	0.1145	0.0302	0.2331	0.1891
0020:	0.2919	0.0142	0.9105	0.0868	0.0959	0.0928	0.2053	0.1703

APPENDIX F

ITEM INFORMATION INDICES, 2-PARAMETER LOGISTIC MODEL

EXHIBIT F-1

ITEM INFORMATION STATISTICS FOR SUBTEST GENERAL SCIENCE; 2-PARAMETER LOGISTIC MODEL

ITEM	MAXIMUM INFORMATION	STANDARD ERROR	POINT OF MAX INFORMATION	STANDARD ERROR	MAXIMUM EFFECTIVENESS	POINT OF MAX EFFECTVNESS	AVERAGE INFORMATION	INDEX OF RELIABILITY
0001:	1.6365	0.3981	-1.4190	0.0900	0.0787	-0.0764	0.4200	0.2958
0002:	0.7959	0.1754	-1.1272	0.0872	0.1508	-0.1897	0.3642	0.2670
0003:	1.4700	0.3199	-0.9416	0.0804	0.2885	-0.2147	0.5831	0.3683
0004:	0.4409	0.1078	-1.0287	0.1035	0.1243	-0.1288	0.2642	0.2090
0005:	0.5923	0.1329	-1.1075	0.0955	0.1413	-0.1463	0.3083	0.2396
0006:	1.9133	0.4196	-1.0329	0.0605	0.2398	-0.1858	0.6337	0.3879
0007:	0.5564	0.1341	-0.8951	0.0834	0.1626	-0.1407	0.3270	0.2464
0008:	0.3861	0.0836	-1.6214	0.1643	0.0701	-0.1047	0.1796	0.1523
0009:	0.7626	0.1701	-1.0596	0.0884	0.1717	-0.1634	0.3894	0.2898
0010:	0.5663	0.1270	-1.0869	0.0873	0.1403	-0.1441	0.3029	0.2325
0011:	0.6537	0.1287	-0.8713	0.0743	0.1873	-0.1536	0.3680	0.2690
0012:	0.1630	0.0487	-0.1577	0.0965	0.0848	-0.0118	0.1422	0.1245
0013:	0.5380	0.1158	-0.1800	0.0587	0.2121	-0.0377	0.3814	0.2761
0014:	0.3213	0.0758	-0.7406	0.0935	0.1117	-0.0878	0.1316	0.1880
0015:	0.2072	0.0611	-1.1485	0.1547	0.0657	-0.0817	0.1480	0.1289
0016:	0.2742	0.0631	-0.9800	0.1165	0.0895	-0.0908	0.1936	0.1622
0017:	0.2300	0.0606	-0.8223	0.1139	0.0806	-0.0728	0.1748	0.1488
0018:	0.5662	0.1141	0.1488	0.0653	0.2241	0.0321	0.3976	0.2845
0019:	0.2288	0.0589	-0.0189	0.0858	0.0913	-0.0019	0.1917	0.1608
0020:	0.3325	0.0729	-0.1364	0.0718	0.1320	-0.0193	0.2613	0.2072
0021:	0.2048	0.0497	0.5648	0.1116	0.0773	0.0491	0.1689	0.1430
0022:	0.1591	0.0431	0.6880	0.1387	0.0595	0.0467	0.1324	0.1169
0023:	0.1343	0.0369	0.8079	0.1521	0.0496	0.0462	0.1125	0.1011
0024:	0.2673	0.0589	1.2843	0.1608	0.0745	0.0991	0.1694	0.1448
0025:	0.2218	0.0621	0.5834	0.1282	0.0831	0.0541	0.1779	0.1510

EXHIBIT F-2

ITEM INFORMATION STATISTICS FOR SUBTEST ARITHMETIC REASONING; 2-PARAMETER LOGISTIC MODEL

ITEM	MAXIMUM INFORMATION	STANDARD ERROR	POINT OF MAX INFORMATION	STANDARD ERROR	MAXIMUM EFFECTIVENESS	POINT OF MAX EFFECTVNESS	AVERAGE INFORMATION	INDEX OF RELIABILITY
0001:	0.2222	0.0849	-2.7519	0.4983	0.0239	-0.0544	0.0700	0.0654
0002:	0.6835	0.2464	-1.9006	0.2326	0.0478	-0.0676	0.1865	0.1572
0003:	1.9873	0.3500	-0.8550	0.0414	0.4042	-0.2864	0.7312	0.4224
0004:	2.2332	0.3586	-0.7470	0.0373	0.5513	-0.2875	0.8334	0.4546
0005:	0.9836	0.1745	-0.5651	0.0475	0.3313	-0.1613	0.5445	0.3525
0006:	0.8031	0.1439	-0.7903	0.0589	0.2350	-0.1687	0.4364	0.3038
0007:	0.2178	0.0602	-1.4558	0.1760	0.0591	-0.0897	0.1379	0.1212
0008:	0.8074	0.1552	-0.8620	0.0618	0.2210	-0.1724	0.4240	0.2978
0009:	0.8402	0.1589	-0.7559	0.0564	0.2509	-0.1707	0.4562	0.3133
0010:	1.3062	0.2560	-0.6589	0.0438	0.3959	-0.2098	0.6311	0.3869
0011:	3.1908	0.4964	-0.5019	0.0325	1.0555	-0.2848	1.1538	0.53**
0012:	0.8672	0.1454	-0.3726	0.0490	0.3237	-0.1084	0.5265	0.3449
0013:	0.4678	0.0812	-0.4638	0.0628	0.1744	-0.0802	0.3298	0.2480
0014:	1.2001	0.1951	-0.3583	0.0437	0.4457	-0.1273	0.6594	0.3974
0015:	1.2348	0.2049	-0.4853	0.0432	0.4297	-0.1670	0.6493	0.3937
0016:	0.3714	0.0759	-0.4091	0.0685	0.1414	-0.0609	0.2779	0.2175
0017:	0.3991	0.0802	-0.1279	0.0675	0.1585	-0.0212	0.3030	0.2326
0018:	0.3819	0.0754	-0.0612	0.0721	0.1442	-0.0084	0.2807	0.2192
0019:	0.4084	0.0841	-0.2718	0.0662	0.1594	-0.0450	0.3051	0.2338
0020:	0.6562	0.1056	0.3964	0.0638	0.2454	0.0921	0.4292	0.3003
0021:	0.4997	0.0920	0.2668	0.0721	0.1945	0.0520	0.3573	0.2632
0022:	0.6101	0.1129	-0.2185	0.0566	0.2389	-0.0502	0.4180	0.2948
0023:	0.3576	0.0688	-0.1344	0.0699	0.1420	-0.0203	0.2773	0.2171
0024:	0.6357	0.1146	0.1471	0.0656	0.2514	0.0352	0.4339	0.3026
0025:	0.5137	0.0947	0.0745	0.0662	0.2046	0.0152	0.3704	0.2703
0026:	0.4775	0.0880	0.0731	0.0661	0.1902	0.0141	0.3500	0.2593
0027:	0.6794	0.1182	0.2532	0.0629	0.2639	0.0626	0.4509	0.3108
0028:	0.3160	0.0621	0.7799	0.1083	0.1084	0.0897	0.2263	0.1845
0029:	0.3303	0.0656	0.8299	0.1111	0.1103	0.0963	0.2307	0.1875
0030:	0.3735	0.0725	0.1438	0.0788	0.1481	0.0225	0.2671	0.2231

EXHIBIT F-3

ITEM INFORMATION STATISTICS FOR SUBTEST WORD KNOWLEDGE; 2-PARAMETER LOGISTIC MODEL

ITEM	MAXIMUM INFORMATION	STANDARD ERROR	MAX	POINT OF INFORMATION	STANDARD ERROR	MAXIMUM EFFECTIVENESS	POINT OF MAX EFFECTVNESS	AVERAGE INFORMATION	INDEX OF RELIABILITY
0001:	1.3743	0.3191		-1.7713	0.1097	0.0514	-0.2000	0.2696	0.2123
0002:	1.3686	0.3043		-1.7870	0.1112	0.0488	-0.2000	0.2644	0.2091
0003:	1.8436	0.3581		-1.4627	0.0702	0.0762	-0.1411	0.4239	0.2977
0004:	0.4017	0.0981		-1.8996	0.1793	0.0529	-0.0859	0.1627	0.1325
0005:	1.4183	0.2895		-1.7250	0.1027	0.0454	-0.1036	0.2872	0.2231
0006:	2.6890	0.6344		-1.2288	0.0803	0.0913	-0.0691	0.6385	0.3897
0007:	0.6529	0.1387		-1.5918	0.1172	0.0786	-0.1025	0.2377	0.1920
0008:	2.3458	0.4644		-1.2063	0.0497	0.1161	-0.0852	0.6098	0.3788
0009:	0.5732	0.1044		-0.7802	0.0723	0.1790	-0.1370	0.3479	0.2581
0010:	1.9449	0.3693		-1.5020	0.0739	0.0637	-0.1270	0.4161	0.2939
0011:	1.2280	0.2253		-1.0259	0.0592	0.2256	-0.1901	0.4984	0.3326
0012:	0.8529	0.1152		-1.5102	0.1207	0.0868	-0.1146	0.2325	0.1886
0013:	1.1808	0.2447		-1.3272	0.0745	0.1189	-0.1247	0.3907	0.2809
0014:	1.0676	0.1917		-0.9509	0.0594	0.2391	-0.1934	0.4811	0.3248
0015:	1.8875	0.3381		-0.9603	0.0483	0.3000	-0.2188	0.6628	0.3986
0016:	0.7019	0.1241		-1.1033	0.0772	0.1559	-0.1560	0.3428	0.2583
0017:	1.8654	0.3280		-0.8412	0.0480	0.4016	-0.2538	0.7113	0.4157
0018:	1.1009	0.2008		-1.0061	0.0599	0.2230	-0.1885	0.4740	0.3216
0019:	0.8154	0.0964		-0.7445	0.0713	0.1683	-0.1239	0.3281	0.2471
0020:	1.7273	0.3094		-1.0452	0.0522	0.2313	-0.1844	0.5942	0.3727
0021:	0.7104	0.1485		-1.0594	0.0781	0.1651	-0.1592	0.3538	0.2614
0022:	0.8761	0.1743		-0.8753	0.0514	0.3039	-0.1783	0.5202	0.3422
0023:	2.8170	0.1401		-0.3911	0.0523	0.3556	-0.1085	0.5029	0.3346
0024:	0.2329	0.0511		-0.3596	0.0863	0.0906	-0.0364	0.1910	0.1603
0025:	0.3472	0.0731		-0.4917	0.0758	0.1299	-0.0678	0.2598	0.2062
0026:	0.9588	0.1582		-0.5104	0.0515	0.3343	-0.1476	0.5446	0.3526
0027:	0.3382	0.0668		-0.4417	0.0784	0.1283	-0.0604	0.2567	0.2042
0028:	0.4648	0.0948		-0.7130	0.0760	0.1865	-0.1123	0.3076	0.2352
0029:	0.1645	0.0389		0.0558	0.1002	0.0656	0.0042	0.1436	0.1256
0030:	0.2720	0.0583		-0.0532	0.0810	0.1084	-0.0084	0.2218	0.1815
0031:	1.3612	0.3020		-1.2251	0.0760	0.1456	-0.1357	0.4561	0.3133
0032:	0.1385	0.0368		-0.0091	0.1088	0.0552	-0.0008	0.1232	0.1087
0033:	0.2926	0.0617		0.2187	0.0868	0.1154	0.0276	0.2340	0.1896
0034:	0.4639	0.0887		-0.2718	0.0692	0.1807	-0.0499	0.3371	0.2521
0035:	0.9418	0.1599		-0.1146	0.0520	0.3733	-0.0365	0.5785	0.3665

EXHIBIT F-4

ITEM INFORMATION STATISTICS FOR SUBTEST PARAGRAPH COMPREHENSION; 2-PARAMETER LOGISTIC MODEL

ITEM	MAXIMUM INFORMATION	STANDARD ERROR	MAX	POINT OF INFORMATION	STANDARD ERROR	MAXIMUM EFFECTIVENESS	POINT OF MAX EFFECTVNESS	AVERAGE INFORMATION	INDEX OF RELIABILITY
0001:	0.5308	0.1115		-1.1952	0.0947	0.1218	-0.1370	0.2750	0.2157
0002:	0.5419	0.1335		-1.8438	0.1516	0.0558	-0.0821	0.1799	0.1524
0003:	1.8524	0.4248		-1.1929	0.0567	0.1445	-0.1262	0.5482	0.3541
0004:	0.3096	0.0869		-1.0964	0.1128	0.0919	-0.1045	0.2015	0.1677
0005:	0.8409	0.1532		-0.7567	0.0666	0.2509	-0.1708	0.4563	0.3133
0006:	0.3185	0.0712		-1.0567	0.1091	0.0962	-0.1053	0.2091	0.1730
0007:	0.3559	0.0749		-1.0902	0.1079	0.1022	-0.1134	0.2226	0.1821
0008:	0.2470	0.0616		-1.5356	0.1882	0.0611	-0.0950	0.1449	0.1265
0009:	0.6657	0.1312		-0.9904	0.0780	0.1705	-0.1569	0.3522	0.2605
0010:	0.4750	0.0938		-0.1508	0.0659	0.1881	-0.0287	0.3472	0.2577
0011:	0.1529	0.0431		-1.4933	0.2030	0.0454	-0.0735	0.1064	0.0961
0012:	0.3321	0.0692		-0.4343	0.0808	0.1262	-0.0586	0.2532	0.2021
0013:	0.6103	0.1254		-1.1088	0.0891	0.1436	-0.1480	0.3138	0.2389
0014:	0.3042	0.0663		-0.7532	0.0997	0.1059	-0.0852	0.2213	0.1812
0015:	0.0127	0.0083		0.2820	0.3419	0.0051	0.0018	0.0126	0.0124

EXHIBIT F-5

ITEM INFORMATION STATISTICS FOR SUBTEST AUTO AND SHOP INFORMATION; 2-PARAMETER LOGISTIC MODEL

ITEM	MAXIMUM INFORMATION	STANDARD ERROR	POINT OF MAX INFORMATION	STANDARD ERROR	MAXIMUM EFFECTIVENESS	POINT OF MAX EFFECTVNESS	AVERAGE INFORMATION	INDEX OF RELIABILITY
0001:	0.0888	0.0329	-2.0323	0.3669	0.0255	-0.0868	0.0617	0.0582
0002:	0.4099	0.1101	-1.4593	0.1493	0.0836	-0.1148	0.2040	0.1694
0003:	0.8370	0.1660	-0.5081	0.0511	0.2950	-0.1343	0.4966	0.3318
0004:	0.3775	0.1271	-1.6328	0.2000	0.0689	-0.1038	0.1763	0.1499
0005:	1.5785	0.3829	-0.5709	0.0413	0.5077	-0.2167	0.7367	0.4242
0006:	1.3885	0.2917	-0.2338	0.0437	0.5367	-0.0838	0.7441	0.4267
0007:	0.4353	0.0902	-0.1002	0.0659	0.1731	-0.0179	0.3251	0.2454
0008:	0.0829	0.0288	-1.0583	0.1992	0.0303	-0.0378	0.0714	0.0666
0009:	0.0478	0.0186	-1.6782	0.3529	0.0168	-0.0332	0.0407	0.0391
0010:	0.4295	0.0963	-0.5005	0.0675	0.1585	-0.0815	0.3061	0.2344
0011:	0.1813	0.0470	-0.3790	0.0955	0.0707	-0.0307	0.1538	0.1333
0012:	0.1120	0.0322	-0.7047	0.1405	0.0425	-0.0351	0.0974	0.0888
0013:	0.5636	0.1077	-0.4559	0.0608	0.2080	-0.0928	0.3792	0.2749
0014:	0.8137	0.1440	-0.5166	0.0584	0.2202	-0.1094	0.3979	0.2846
0015:	0.4880	0.1011	-0.1153	0.0622	0.1926	-0.0224	0.3536	0.2612
0016:	0.5802	0.1186	-0.1404	0.0582	0.2297	-0.0314	0.4052	0.2884
0017:	0.6814	0.1383	0.2227	0.0680	0.2663	0.0585	0.4536	0.3120
0018:	0.6196	0.1285	0.2153	0.0710	0.2427	0.0501	0.4230	0.2973
0019:	0.1882	0.0424	-0.9177	0.1355	0.0593	-0.0613	0.1330	0.1174
0020:	0.2866	0.0648	-0.1149	0.0766	0.1140	-0.0144	0.2313	0.1879
0021:	0.1601	0.0381	0.4610	0.1147	0.0620	0.0330	0.1370	0.1205
0022:	0.5965	0.1110	0.2393	0.0692	0.2328	0.0538	0.4101	0.2908
0023:	1.2036	0.2112	0.5381	0.0637	0.4054	0.1763	0.6276	0.3856
0024:	0.2772	0.0569	0.9798	0.1248	0.0892	0.0829	0.1935	0.1621
0025:	0.0799	0.0239	0.6626	0.1669	0.0308	0.0244	0.0722	0.0674

EXHIBIT F-6

ITEM INFORMATION STATISTICS FOR SUBTEST MATHEMATICS KNOWLEDGE; 2-PARAMETER LOGISTIC MODEL

ITEM	MAXIMUM INFORMATION	STANDARD ERROR	POINT OF MAX INFORMATION	STANDARD ERROR	MAXIMUM EFFECTIVENESS	POINT OF MAX EFFECTVNESS	AVERAGE INFORMATION	INDEX OF RELIABILITY
0001:	2.0692	0.7978	-1.1330	0.0948	0.1690	-0.1425	0.6102	0.3790
0002:	0.5249	0.1386	-1.1641	0.1053	0.1247	-0.1376	0.2776	0.2173
0003:	0.8148	0.1520	-0.4471	0.0491	0.2960	-0.1191	0.4954	0.3313
0004:	1.2429	0.2411	-0.7201	0.0460	0.3570	-0.2108	0.5954	0.3732
0005:	0.2365	0.0606	-1.2695	0.1482	0.0688	-0.0921	0.1564	0.1353
0006:	1.2389	0.2134	-0.3540	0.0419	0.4605	-0.1285	0.6742	0.4027
0007:	1.3634	0.3042	-0.5656	0.0328	0.4459	-0.1977	0.6733	0.4024
0008:	0.4078	0.0796	-0.3804	0.0661	0.1559	-0.0616	0.3005	0.2311
0009:	0.9247	0.1915	-0.6337	0.0497	0.2992	-0.1666	0.5101	0.3378
0010:	0.5264	0.1226	-0.4699	0.0591	0.1940	-0.0904	0.3593	0.2643
0011:	0.2333	0.0655	-0.2766	0.0823	0.0917	-0.0284	0.1927	0.1616
0012:	0.9729	0.1587	-0.0470	0.0494	0.3877	-0.0154	0.5938	0.3726
0013:	2.2109	0.3733	-0.2718	0.0365	0.8403	-0.1392	0.9943	0.4986
0014:	1.0815	0.1978	0.0515	0.0542	0.4229	0.0178	0.6308	0.3869
0015:	0.1432	0.0350	0.5550	0.1262	0.0549	0.0354	0.1230	0.1096
0016:	0.8398	0.1784	-0.2387	0.0501	0.3262	-0.0690	0.5267	0.3450
0017:	1.1109	0.1784	0.1007	0.0505	0.4408	0.0358	0.6496	0.3938
0018:	1.1718	0.2200	-0.1037	0.0486	0.4647	-0.0381	0.6736	0.4025
0019:	0.4259	0.0821	-0.2818	0.0640	0.1658	-0.0482	0.3150	0.2395
0020:	0.3104	0.0674	0.0858	0.0791	0.1236	0.0115	0.2474	0.1983
0021:	0.2510	0.0555	0.3893	0.0999	0.0971	0.0419	0.2027	0.1685
0022:	0.5233	0.0955	0.5401	0.0876	0.1880	0.1007	0.3520	0.2604
0023:	0.5569	0.0954	0.7254	0.0884	0.1818	0.1287	0.3488	0.2586
0024:	0.2524	0.0502	0.9926	0.1220	0.0821	0.0876	0.1787	0.1523
0025:	0.4801	0.0915	0.6484	0.0943	0.1660	0.1081	0.3210	0.2430

EXHIBIT F-7

ITEM INFORMATION STATISTICS FOR SUBTEST MECHANICAL REASONING; 2-PARAMETER LOGISTIC MODEL

ITEM	MAXIMUM INFORMATION	STANDARD ERROR	POINT OF MAX INFORMATION	STANDARD ERROR	MAXIMUM EFFECTIVENESS	POINT OF MAX EFFECTVNESS	AVERAGE INFORMATION	INDEX OF RELIABILITY
0001:	0.2832	0.0962	-2.1772	0.2925	0.0393	-0.0749	0.1099	0.0990
0002:	0.8609	0.2186	-1.0302	0.0753	0.1902	-0.1726	0.4041	0.2878
0003:	0.3934	0.0990	-1.3192	0.1279	0.0926	-0.1187	0.2145	0.1786
0004:	0.2321	0.0482	0.4150	0.0968	0.0896	0.0415	0.1892	0.1591
0005:	0.4092	0.0803	-0.3505	0.0678	0.1574	-0.0573	0.3026	0.2323
0006:	0.1101	0.0334	-0.6689	0.1371	0.0420	-0.0330	0.0963	0.0879
0007:	0.3637	0.0828	-0.3935	0.0700	0.1391	-0.0578	0.2740	0.2150
0008:	0.9527	0.1788	-0.5245	0.0513	0.3297	-0.1499	0.5399	0.3506
0009:	0.1927	0.0467	-0.8320	0.1231	0.0682	-0.0704	0.1511	0.1312
0010:	1.2 38	0.2043	-0.3755	0.0453	0.4545	-0.1350	0.6690	0.4008
0011:	0. 320	0.0383	-1.0621	0.1621	0.0461	-0.0558	0.1059	0.0957
0012:	0.6843	0.1156	-0.3412	0.0578	0.2230	-0.0739	0.3980	0.2647
0013:	0.5983	0.1287	-0.5943	0.0610	0.2076	-0.1192	0.3825	0.2767
0014:	0.5959	0.1176	-0.341	0.0575	0.2273	-0.0750	0.4039	0.2877
0015:	0.4570	0.0907	-0.304	0.0643	0.1769	-0.0549	0.3319	0.2492
0016:	0.1797	0.0441	-0.4991	0.1022	0.0690	-0.0393	0.1507	0.1310
0017:	0.1864	0.0438	-0.061	0.0927	0.0743	-0.0055	0.1603	0.1381
0018:	0.3679	0.0749	-0.0	0.0718	0.1467	-0.0056	0.2846	0.2216
0019:	0.0692	0.0222	[illegible]	0.1806	0.0270	0.0197	0.0636	0.0598
0020:	0.2418	0.0539	-0.1364	0.0828	0.0862	-0.0147	[illegible]	0.1669
0021:	0.2959	0.0636	0.2175	0.0854	0.1167	0.0277	[illegible]	0.1911
0022:	0.1009	0.0280	0.7259	0.1597	0.0[illegible]	0.0328	0.0886	0.0814
0023:	0.4371	0.0873	0.5037	0.0832	[illegible].1610	0.0631	0.3101	0.2367
0024:	0.2097	0.0473	0.3511	0.0991	0.0818	0.0325	0.1748	0.1488
0025:	0.3709	0.0726	0.4761	0.0876	0.1389	0.0695	0.2745	0.2154

EXHIBIT F-8

ITEM INFORMATION STATISTICS FOR SUBTEST E[illegible]CTRONICS KNOWLEDGE; 2-PARAMETER LOGISTIC MODEL

ITEM	MAXIMUM INFORMATION	STANDARD ERROR	POINT OF MAX INFORMATION	STANDARD ERROR	MAXIMUM EFFECTIVENESS	POINT OF MAX EFFECTVNESS	AVERAGE INFORMATION	INDEX OF RELIABILITY
0001:	0.5352	0.1389	-1.2740	0.1169	0.1129	-0.1333	0.2646	0.2092
0002:	0.6858	0.1687	-0.8559	0.0703	0.1967	-0.1572	0.3824	0.2766
0003:	1.0065	0.2311	-0.7043	0.0642	0.3044	-0.1851	0.5244	0.3440
0004:	1.2118	0.2525	-0.6897	0.0521	0.3605	-0.2047	0.5940	0.3727
0005:	0.5083	0.1292	-1.1179	0.1026	0.1276	-0.1368	0.2785	0.2178
0006:	0.9984	0.2117	-0.5774	0.0507	0.3334	-0.1653	0.5479	0.3540
0007:	0.6193	0.1418	-0.6862	0.0650	0.2039	-0.1340	0.3809	0.2758
0008:	0.4098	0.0852	-0.6811	0.0783	0.1420	-0.0995	0.2829	0.2205
0009:	0.2398	0.0630	-1.0096	0.1231	0.0782	-0.0852	0.1720	0.1467
0010:	0.4866	0.1025	-0.2530	0.0622	0.1900	-0.0484	0.3506	0.2596
0011:	0.1305	0.0365	0.2652	0.1168	0.0516	0.0161	0.1160	0.1039
0012:	0.4968	0.1018	0.0365	0.0650	0.1981	0.0073	0.3612	0.2654
0013:	0.3682	0.0818	0.2577	0.0783	0.1442	0.0383	0.2813	0.2196
0014:	0.0647	0.0217	-0.0994	0.1495	0.0258	-0.0031	0.0610	0.0575
0015:	0.5225	0.1032	0.1667	0.0668	0.2064	0.0342	0.3734	0.2719
0016:	0.2481	0.0565	0.2812	0.0907	0.0974	0.0305	0.2029	0.1687
0017:	0.0195	0.0107	3.6111	1.0098	0.0061	0.0254	0.0152	0.0149
0018:	0.2497	0.0579	0.2997	0.0898	0.0978	0.0326	0.2037	0.1692
0019:	0.2979	0.0692	0.1919	0.0830	0.1178	0.0246	0.2379	0.1922
0020:	0.2512	0.0569	0.9227	0.1287	0.0841	0.0838	0.1826	0.1544

APPENDIX G

ITEM INFORMATION INDICES, 3-PARAMETER LOGISTIC MODEL

EXHIBIT G-1

ITEM INFORMATION STATISTICS FOR GENERAL SCIENCE; 3-PARAMETER LOGISTIC MODEL

ITEM	MAXIMUM INFORMATION	STANDARD ERROR	POINT OF MAX INFORMATION	STANDARD ERROR	MAXIMUM EFFECTIVENESS	POINT OF MAX EFFECTVNESS	AVERAGE INFORMATION	INDEX OF RELIABILITY
0001:	0.6206	0.1709	-1.3812	0.1977	0.1307	-0.9047	0.2121	0.1750
0002:	0.4827	0.1187	-0.6960	0.1651	0.1653	-0.4339	0.2679	0.2113
0003:	1.0424	0.2843	-0.5191	0.1121	0.3738	-0.4085	0.4802	0.3152
0004:	0.3033	0.0756	-0.3678	0.1892	0.1163	-0.2038	0.2067	0.1713
0005:	0.3476	0.0848	-0.7736	0.1752	0.1188	-0.3945	0.2170	0.1783
0006:	1.1317	0.2994	-0.7864	0.1217	0.3542	-0.6138	0.4498	0.3103
0007:	0.4413	0.1198	-0.1168	0.1470	0.1753	-0.0767	0.2661	0.2102
0008:	0.2097	0.0561	-1.2862	0.2507	0.0602	-0.4932	0.1237	0.1101
0009:	0.4891	0.1101	-0.6285	0.1632	0.1622	-0.3823	0.2668	0.2106
0010:	0.3403	0.0819	-0.6458	0.1812	0.1215	-0.3395	0.2178	0.1788
0011:	0.5107	0.1132	-0.3003	0.1326	0.1978	-0.1948	0.3056	0.2341
0012:	0.9303	0.3807	0.9552	0.1107	0.2533	0.8014	0.2642	0.2090
0013:	2.3845	1.5309	0.0569	0.0513	0.4494	0.0494	0.6783	0.4042
0014:	0.2680	0.0674	-0.0843	0.1724	0.1067	-0.0404	0.1964	0.1642
0015:	0.1536	0.0439	-0.1946	0.2672	0.0608	-0.0731	0.1220	0.1088
0016:	0.2119	0.0514	-0.4365	0.1879	0.0814	-0.1698	0.1624	0.1397
0017:	0.2035	0.0543	0.0572	0.2089	0.0811	0.0251	0.1543	0.1336
0018:	4.8509	3.7466	0.5903	0.0401	1.6412	0.5883	1.0189	0.5042
0019:	0.8915	0.2434	0.8472	0.1018	0.2101	0.8447	0.2647	0.2093
0020:	0.4270	0.1098	0.4484	0.1162	0.1607	0.2617	0.2630	0.2082
0021:	0.3849	0.1243	1.0633	0.1315	0.1143	0.6089	0.1908	0.1600
0022:	0.6645	0.2505	1.2539	0.1321	0.1487	0.9146	0.2000	0.1667
0023:	0.5054	0.1833	1.2970	0.1427	0.1160	0.8868	0.1730	0.1478
0024:	2.5945	0.8619	1.1625	0.0783	0.5680	1.0332	0.4950	0.3311
0025:	5.9798	3.1962	0.9648	0.1217	1.5240	0.9289	0.7833	0.4392

EXHIBIT G-2

ITEM INFORMATION STATISTICS FOR ARITHMETIC REASONING; 3-PARAMETER LOGISTIC MODEL

ITEM	MAXIMUM INFORMATION	STANDARD ERROR	POINT OF MAX INFORMATION	STANDARD ERROR	MAXIMUM EFFECTIVENESS	POINT OF MAX EFFECTVNESS	AVERAGE INFORMATION	INDEX OF RELIABILITY
0001:	0.1182	0.0471	-2.3887	0.4447	0.0222	-0.5750	0.0508	0.0484
0002:	0.2838	0.0981	-1.9013	0.2571	0.0488	-0.8297	0.1000	0.0909
0003:	1.1425	0.2207	-0.6179	0.1011	0.3929	-0.4785	0.5008	0.3337
0004:	1.4327	0.2605	-0.4147	0.0921	0.5324	-0.3413	0.6000	0.3750
0005:	0.9904	0.2052	0.0156	0.0940	0.3950	0.0124	0.4740	0.3216
0006:	0.5825	0.1123	-0.4342	0.1237	0.2209	-0.2781	0.3485	0.2573
0007:	0.1477	0.0408	-0.8067	0.2653	0.0528	-0.2866	0.1106	0.0996
0008:	0.5116	0.1008	-0.4535	0.1456	0.1913	-0.2843	0.3084	0.2340
0009:	0.5739	0.1124	-0.3741	0.1296	0.2188	-0.2405	0.3414	0.2545
0010:	1.1603	0.2886	-0.1034	0.0966	0.4608	-0.0849	0.5186	0.3402
0011:	2.5968	0.4971	-0.2083	0.0586	1.0164	-0.1824	0.9597	0.4897
0012:	0.8903	0.1771	0.1054	0.0888	0.3537	0.0783	0.4664	0.3181
0013:	0.6005	0.1365	0.3125	0.1134	0.2313	0.2237	0.3183	0.2415
0014:	1.3255	0.2704	0.0568	0.0736	0.5281	0.0456	0.6155	0.3810
0015:	1.2406	0.2496	-0.0069	0.0811	0.4949	-0.0056	0.5703	0.3632
0016:	0.8637	0.2222	0.5496	0.0883	0.3047	0.4478	0.3415	0.2545
0017:	1.2935	0.3680	0.6808	0.0711	0.4234	0.5817	0.4220	0.2968
0018:	3.0178	1.0890	0.7265	0.0520	0.9408	0.6790	0.6385	0.3897
0019:	0.5050	0.1309	0.3666	0.1175	0.1929	0.2375	0.2933	0.2268
0020:	1.1242	0.2568	0.6591	0.0630	0.3812	0.4938	0.4940	0.3307
0021:	1.9824	0.6315	0.7421	0.0571	0.6216	0.6495	0.5744	0.3648
0022:	1.3659	0.3619	0.4621	0.0693	0.4877	0.3921	0.5071	0.3365
0023:	0.8388	0.2154	0.6338	0.0856	0.2861	0.4954	0.3459	0.2570
0024:	3.7535	1.8317	0.6430	0.0459	1.2348	0.5927	0.8498	0.4594
0025:	1.4947	0.4322	0.6781	0.0456	0.4903	0.5777	0.4824	0.3299
0026:	0.7292	0.1809	0.5663	0.0869	0.2599	0.3987	0.3633	0.2665
0027:	1.1048	0.2670	0.5749	0.0678	0.3891	0.4337	0.4990	0.3329
0028:	1.2418	0.4219	1.0818	0.0786	0.3098	0.8697	0.3546	0.2618
0029:	1.3493	0.4675	1.0822	0.0771	0.3350	0.8780	0.3767	0.2736
0030:	0.8335	0.2338	0.7606	0.0878	0.2673	0.5756	0.3396	0.2535

EXHIBIT G-3

ITEM INFORMATION STATISTICS FOR WORD KNOWLEDGE; 3-PARAMETER LOGISTIC MODEL

ITEM	MAXIMUM INFORMATION	STANDARD ERROR	MAX	POINT OF INFORMATION	STANDARD ERROR	MAXIMUM EFFECTIVENESS	POINT OF MAX EFFECTVNESS	AVERAGE INFORMATION	INDEX OF RELIABILITY
0001:	0.4065	0.1060	:	-1.9529	0.2259	: 0.0566	-1.0198	0.1093	0.0986
0002:	0.4004	0.1043	:	-2.0156	0.2257	: 0.0533	-1.0262	0.1044	0.0945
0003:	0.7278	0.1693	:	-1.3069	0.1765	: 0.1580	-0.9155	0.2397	0.1833
0004:	0.2047	0.0528	:	-1.6479	0.2720	: 0.0483	-0.6041	0.1017	0.0923
0005:	0.5379	0.1235	:	-1.8933	0.1982	: 0.0730	-1.0890	0.1340	0.1182
0006:	1.9853	0.6278	:	-0.7995	0.0825	: 0.5969	-0.7057	0.5638	0.3605
0007:	0.2933	0.0694	:	-1.2501	0.2395	: 0.0785	-0.6115	0.1500	0.1304
0008:	2.0068	0.4548	:	-0.6506	0.0764	: 0.6619	-0.5836	0.5833	0.3684
0009:	0.5125	0.1091	:	-0.2696	0.1173	: 0.1999	-0.1669	0.3201	0.2425
0010:	0.6991	0.1558	:	-1.4851	0.1863	: 0.1308	-0.9967	0.2093	0.1731
0011:	0.9384	0.2057	:	-0.5253	0.0989	: 0.3367	-0.4019	0.4360	0.3036
0012:	0.3162	0.0715	:	-1.2479	0.2046	: 0.0867	-0.5844	0.1672	0.1433
0013:	0.8352	0.1960	:	-0.6563	0.1171	: 0.2808	-0.5189	0.3474	0.2878
0014:	0.8946	0.1787	:	-0.3875	0.0862	: 0.3369	-0.2957	0.4354	0.3033
0015:	1.5116	0.3300	:	-0.5813	0.0751	: 0.5247	-0.4774	0.5882	0.3743
0016:	0.5754	0.1145	:	-0.4809	0.1238	: 0.2121	-0.3267	0.3165	0.2404
0017:	1.9364	0.3825	:	-0.3787	0.0675	: 0.7267	-0.3244	0.7224	0.4184
0018:	1.0179	0.2113	:	-0.3787	0.0929	: 0.3837	-0.3009	0.4570	0.3137
0019:	0.7367	0.1595	:	0.0642	0.0981	: 0.2934	0.0484	0.3796	0.2752
0020:	1.3580	0.2852	:	-0.6025	0.0839	: 0.4666	-0.4943	0.5343	0.3482
0021:	0.8127	0.1990	:	-0.1856	0.1046	: 0.3198	-0.1476	0.3833	0.2771
0022:	2.0769	0.5335	:	0.0609	0.0648	: 0.8271	0.0847	0.7048	0.4134
0023:	4.0207	1.8530	:	0.3018	0.0502	: 1.5365	0.2843	0.9899	0.4974
0024:	1.0363	0.3073	:	0.6656	0.0728	: 0.3434	0.5587	0.3586	0.2638
0025:	0.9733	0.2879	:	0.4732	0.0765	: 0.3541	0.3902	0.3870	0.2790
0026:	1.8282	0.4206	:	0.0866	0.0633	: 0.7269	0.0751	0.7020	0.4125
0027:	0.5052	0.1166	:	0.2518	0.1089	: 0.1875	0.1620	0.3028	0.2324
0028:	0.6819	0.1595	:	0.1191	0.1060	: 0.2706	0.0883	0.3583	0.2638
0029:	0.6959	0.2390	:	0.9077	0.0923	: 0.2031	0.6914	0.2553	0.2034
0030:	1.1728	0.3736	:	0.7154	0.0704	: 0.3777	0.5993	0.3961	0.2837
0031:	0.8955	0.2281	:	-0.6882	0.1214	: 0.2969	-0.5349	0.3785	0.2746
0032:	0.5462	0.2027	:	0.9596	0.1086	: 0.1565	0.6823	0.2119	0.1749
0033:	7.1853	2.6954	:	0.7601	0.0547	: 2.1666	0.7365	1.0226	0.5056
0034:	0.8127	0.1911	:	0.2972	0.0838	: 0.3139	0.2174	0.4209	0.2962
0035:	3.0767	0.8999	:	0.3601	0.0468	: 1.1570	0.3275	0.8231	0.4800

EXHIBIT G-4

ITEM INFORMATION STATISTICS FOR PARAGRAPH COMPREHENSION; 3-PARAMETER LOGISTIC MODEL

ITEM	MAXIMUM INFORMATION	STANDARD ERROR	MAX	POINT OF INFORMATION	STANDARD ERROR	MAXIMUM EFFECTIVENESS	POINT OF MAX EFFECTVNESS	AVERAGE INFORMATION	INDEX OF RELIABILITY
0001:	0.5442	0.1325	:	-0.3743	0.1800	: 0.2067	-0.2622	0.2977	0.2284
0002:	0.3897	0.0966	:	-1.4389	0.2118	: 0.0824	-0.7455	0.1544	0.1337
0003:	1.7729	0.5420	:	-0.6890	0.1306	: 0.5748	-0.6007	0.5633	0.3603
0004:	0.3207	0.0771	:	-0.2761	0.2108	: 0.1253	-0.1522	0.2164	0.1779
0005:	0.8692	0.1960	:	-0.3734	0.1143	: 0.3298	-0.2673	0.4630	0.3165
0006:	0.4252	0.1253	:	-0.0451	0.1769	: 0.1695	-0.0297	0.2562	0.2040
0007:	0.3352	0.0766	:	-0.4322	0.1989	: 0.1272	-0.2311	0.2243	0.1832
0008:	0.1938	0.0504	:	-0.8618	0.2516	: 0.0669	-0.3318	0.1352	0.1191
0009:	0.6349	0.1464	:	-0.4688	0.1535	: 0.2350	-0.3130	0.3508	0.2597
0010:	1.0306	0.4112	:	0.3145	0.0760	: 0.3958	0.2417	0.4948	0.3310
0011:	0.1295	0.0370	:	-0.6393	0.2895	: 0.0485	-0.1927	0.1032	0.0936
0012:	0.7543	0.3000	:	0.2944	0.0995	: 0.2913	0.2194	0.3811	0.2759
0013:	0.5144	0.1160	:	-0.6127	0.1716	: 0.1823	-0.3834	0.2934	0.2268
0014:	0.3535	0.0935	:	-0.0750	0.1765	: 0.1408	-0.0413	0.2421	0.1949
0015:	0.0166	0.0104	:	2.6105	1.0210	: 0.0055	0.1491	0.0133	0.0131

EXHIBIT G-5

ITEM INFORMATION STATISTICS FOR AUTO AND SHOP INFORMATION; 3-PARAMETER LOGISTIC MODEL

ITEM	MAXIMUM INFORMATION	STANDARD ERROR	POINT OF MAX INFORMATION	STANDARD ERROR	MAXIMUM EFFECTIVENESS	POINT OF MAX EFFECTVNESS	AVERAGE INFORMATION	INDEX OF RELIABILITY
0001:	0.0667	0.0235	-0.8709	0.3995	0.0247	-0.1645	0.0564	0.0534
0002:	0.2618	0.0720	-0.9727	0.2234	0.0836	-0.4473	0.1606	0.1384
0003:	1.0212	0.2211	0.0338	0.0879	0.4072	0.0286	0.4939	0.3306
0004:	0.2136	0.0668	-1.1335	0.2639	0.0647	-0.4712	0.1293	0.1145
0005:	1.8520	0.5174	-0.0712	0.0588	0.7371	-0.0622	0.7003	0.4119
0006:	2.9095	0.8179	0.2069	0.0579	1.1383	0.1878	0.9206	0.4793
0007:	1.1932	0.3120	0.5858	0.0817	0.4127	0.4879	0.4398	0.3055
0008:	0.0844	0.0258	0.0707	0.3189	0.0336	0.0162	0.0743	0.0691
0009:	0.0509	0.0180	-0.2629	0.3980	0.0202	-0.0389	0.0469	0.0448
0010:	0.4805	0.1167	0.1667	0.1305	0.1900	0.1070	0.2522	0.2262
0011:	0.2215	0.0621	0.6202	0.2002	0.0806	0.2988	0.1466	0.1278
0012:	0.1182	0.0330	0.1895	0.2564	0.0469	0.0842	0.0998	0.0907
0013:	0.5587	0.1193	-0.0158	0.1106	0.2228	-0.0098	0.3501	0.2593
0014:	0.7771	0.2165	0.1749	0.1015	0.3064	0.1330	0.3905	0.2808
0015:	0.7479	0.1891	0.4745	0.0964	0.2748	0.3465	0.3681	0.2691
0016:	0.8219	0.2317	0.4167	0.0888	0.3440	0.3202	0.4291	0.3002
0017:	2.5183	0.9135	0.7006	0.0627	0.8054	0.6315	0.6655	0.3596
0018:	3.7810	1.4319	0.7045	0.0588	1.1961	0.6587	0.8081	0.4469
0019:	0.1857	0.0485	-0.3151	0.1829	0.0728	-0.1109	0.1498	0.1295
0020:	0.4458	0.1153	0.6245	0.1293	0.1572	0.3964	0.2424	0.1951
0021:	0.3800	0.1215	1.2071	0.1422	0.0879	0.7287	0.1569	0.1356
0022:	1.6846	0.4760	0.6984	0.0684	0.5458	0.5968	0.5437	0.3522
0023:	2.8144	0.7871	0.7067	0.0509	0.9020	0.6195	0.8345	0.4549
0024:	1.2655	0.4675	1.2527	0.0902	0.2677	1.0148	0.3018	0.2318
0025:	0.1484	0.0541	1.5474	0.2493	0.0389	0.5551	0.0786	0.0728

EXHIBIT G-6

ITEM INFORMATION STATISTICS FOR MATHEMATICS KNOWLEDGE; 3-PARAMETER LOGISTIC MODEL

ITEM	MAXIMUM INFORMATION	STANDARD ERROR	POINT OF MAX INFORMATION	STANDARD ERROR	MAXIMUM EFFECTIVENESS	POINT OF MAX EFFECTVNESS	AVERAGE INFORMATION	INDEX OF RELIABILITY
0001:	0.9862	0.2792	-1.0645	0.1461	0.2548	-0.8083	0.3434	0.2556
0002:	0.3622	0.0859	-0.7570	0.1772	0.1238	-0.4029	0.2215	0.1813
0003:	0.8186	0.1709	0.0024	0.0846	0.3265	0.0017	0.4549	0.3127
0004:	0.9292	0.1867	-0.0729	0.1067	0.3699	-0.0585	0.4344	0.3028
0005:	0.1901	0.0467	-0.6307	0.2239	0.0703	-0.2391	0.1418	0.1242
0006:	1.3770	0.2996	0.1890	0.0737	0.5413	0.1558	0.5955	0.3732
0007:	1.8815	0.5553	0.1854	0.0759	0.7390	0.1667	0.6243	0.3843
0008:	0.4563	0.0947	0.1221	0.1224	0.1812	0.0714	0.2991	0.2302
0009:	0.8395	0.1922	0.1342	0.1042	0.3325	0.1065	0.3958	0.2836
0010:	0.5575	0.1450	0.2306	0.1212	0.2184	0.1571	0.3177	0.2411
0011:	0.4229	0.1266	0.7694	0.1275	0.1385	0.5161	0.2031	0.1688
0012:	1.5620	0.3618	0.4189	0.0624	0.5795	0.3467	0.6286	0.3860
0013:	5.6631	1.6882	0.3154	0.0510	2.1545	0.3005	1.2540	0.5563
0014:	2.9050	0.8901	0.5508	0.0478	1.0102	0.4986	0.8206	0.4507
0015:	0.4153	0.1512	1.2854	0.1363	0.0987	0.8103	0.1530	0.1327
0016:	3.4499	1.3475	0.5386	0.0473	1.2006	0.5071	0.7739	0.4363
0017:	2.2677	0.5629	0.5187	0.0520	0.8047	0.4514	0.7608	0.4321
0018:	4.2786	1.4748	0.4908	0.0411	1.5239	0.4618	0.9883	0.4971
0019:	0.8342	0.2057	0.5930	0.0903	0.2895	0.4703	0.3414	0.2545
0020:	0.8034	0.2663	0.8788	0.0899	0.2377	0.6820	0.2902	0.2249
0021:	2.0485	0.7991	1.0593	0.0689	0.4930	0.9552	0.4051	0.2883
0022:	4.9219	1.6619	0.9226	0.0525	1.3135	0.8718	0.8164	0.4495
0023:	3.0745	0.9078	0.9590	0.0517	0.8102	0.8652	0.6650	0.3994
0024:	0.7890	0.2473	1.2270	0.0942	0.1847	0.8708	0.2556	0.2035
0025:	3.0299	1.0218	0.9729	0.0559	0.7866	0.8836	0.6255	0.3848

EXHIBIT C-7

ITEM INFORMATION STATISTICS FOR MECHANICAL REASONING; 3-PARAMETER LOGISTIC MODEL

ITEM	MAXIMUM INFORMATION	STANDARD ERROR	POINT OF MAX INFORMATION	STANDARD ERROR	MAXIMUM EFFECTIVENESS	POINT OF MAX EFFECTVNESS	AVERAGE INFORMATION	INDEX OF RELIABILITY
0001:	0.1580	0.0558	-1.7382	0.3184	0.0374	-0.5522	0.0811	0.0750
0002:	0.5375	0.1349	-0.5595	0.1722	0.1932	-0.3703	0.2985	0.2287
0003:	0.2646	0.0675	-0.8267	0.2071	0.0900	-0.3802	0.1718	0.1466
0004:	0.5947	0.1823	1.0220	0.1014	0.1658	0.7043	0.2365	0.1913
0005:	0.4318	0.0901	0.1284	0.1290	0.1714	0.0732	0.2876	0.2233
0006:	0.7072	0.2410	1.1184	0.1115	0.1674	0.8360	0.1756	0.1494
0007:	0.8065	0.2616	0.5966	0.0950	0.2790	0.4788	0.3219	0.2435
0008:	0.7991	0.1581	-0.1384	0.1052	0.3166	-0.0980	0.4465	0.3087
0009:	0.1762	0.0420	-0.2124	0.2246	0.0697	-0.0784	0.1405	0.1232
0010:	1.2709	0.1270	-0.0046	0.0808	0.5069	-0.0036	0.6102	0.3790
0011:	0.1092	0.0300	-0.0198	0.3113	0.0436	-0.0058	0.0924	0.0846
0012:	1.0067	0.2629	0.4051	0.0912	0.3758	0.3281	0.4271	0.2993
0013:	0.7588	0.1943	0.2132	0.1185	0.2974	0.1653	0.3674	0.2687
0014:	0.7808	0.1841	0.3228	0.1053	0.2995	0.2426	0.3870	0.2790
0015:	0.4548	0.0984	0.2108	0.1276	0.1791	0.1249	0.2925	0.2263
0016:	0.1707	0.0428	0.2872	0.2220	0.0671	0.1067	0.1341	0.1183
0017:	0.7465	0.2255	0.9494	0.0968	0.2089	0.7492	0.2478	0.1986
0018:	1.2500	0.3726	0.6878	0.0721	0.4089	0.5781	0.4254	0.2985
0019:	2.4160	1.3782	1.3947	0.0691	0.3918	1.2920	0.2793	0.2183
0020:	0.3219	0.0868	0.6451	0.1552	0.1146	0.3552	0.1948	0.1631
0021:	1.3518	0.4250	0.9103	0.0769	0.3793	0.7747	0.3809	0.2758
0022:	0.7229	0.3016	1.4245	0.1167	0.1329	1.0913	0.1658	0.1422
0023:	0.9226	0.2685	0.8681	0.0809	0.2789	0.6403	0.3677	0.2688
0024:	0.3989	0.1259	0.9995	0.1297	0.1185	0.5925	0.1923	0.1613
0025:	1.0572	0.3124	0.9427	0.0790	0.2980	0.7386	0.3579	0.2636

EXHIBIT C-8

ITEM INFORMATION STATISTICS FOR ELECTRONICS KNOWLEDGE; 3-PARAMETER LOGISTIC MODEL

ITEM	MAXIMUM INFORMATION	STANDARD ERROR	POINT OF MAX INFORMATION	STANDARD ERROR	MAXIMUM EFFECTIVENESS	POINT OF MAX EFFECTVNESS	AVERAGE INFORMATION	INDEX OF RELIABILITY
0001:	0.3363	0.0917	-0.8536	0.1915	0.1106	-0.4446	0.2008	0.1672
0002:	0.9729	0.2695	-0.0321	0.1085	0.3879	-0.0268	0.4186	0.2951
0003:	1.0797	0.2826	-0.2368	0.1006	0.4212	-0.1881	0.5061	0.3360
0004:	1.0007	0.2285	-0.3823	0.0980	0.3808	-0.2666	0.4971	0.3320
0005:	0.3879	0.0986	-0.6017	0.1781	0.1394	-0.3430	0.2389	0.1928
0006:	0.9857	0.2235	-0.1709	0.0971	0.3888	-0.1306	0.4971	0.3320
0007:	0.6883	0.1693	-0.0204	0.1250	0.2745	-0.0151	0.3666	0.2682
0008:	0.3839	0.0819	-0.1548	0.1511	0.1521	-0.0863	0.2602	0.2065
0009:	0.2219	0.0539	-0.0826	0.2338	0.0884	-0.0394	0.1630	0.1402
0010:	0.5046	0.1139	0.1429	0.1116	0.2001	0.0855	0.3252	0.2484
0011:	0.3086	0.1215	1.2930	0.1756	0.0758	0.7557	0.1242	0.1105
0012:	0.9910	0.3109	0.5566	0.0840	0.3504	0.4346	0.4248	0.2982
0013:	0.5724	0.1741	0.7169	0.1071	0.1933	0.4658	0.2924	0.2262
0014:	0.0802	0.0260	0.9840	0.3257	0.0267	0.2205	0.0635	0.0597
0015:	0.9412	0.2808	0.5870	0.0826	0.3298	0.4422	0.4229	0.2972
0016:	0.4363	0.1363	0.8835	0.1293	0.1373	0.5400	0.2178	0.1789
0017:	0.2763	0.2199	2.9807	0.6128	0.0103	1.5652	0.0189	0.0186
0018:	0.3084	0.0833	0.7625	0.1420	0.1070	0.3681	0.1947	0.1630
0019:	0.5299	0.1819	0.8158	0.1178	0.1697	0.5412	0.2514	0.2009
0020:	1.0173	0.4373	1.2385	0.1095	0.2238	0.9635	0.2720	0.2138

APPENDIX H

TEST INFORMATION AND STANDARD ERROR CURVES, 1-PARAMETER LOGISTIC MODEL

EXHIBIT H-1

TEST INFORMATION AND STANDARD ERROR CURVES FOR GENERAL SCIENCE; 1-PARAMETER LOGISTIC MODEL

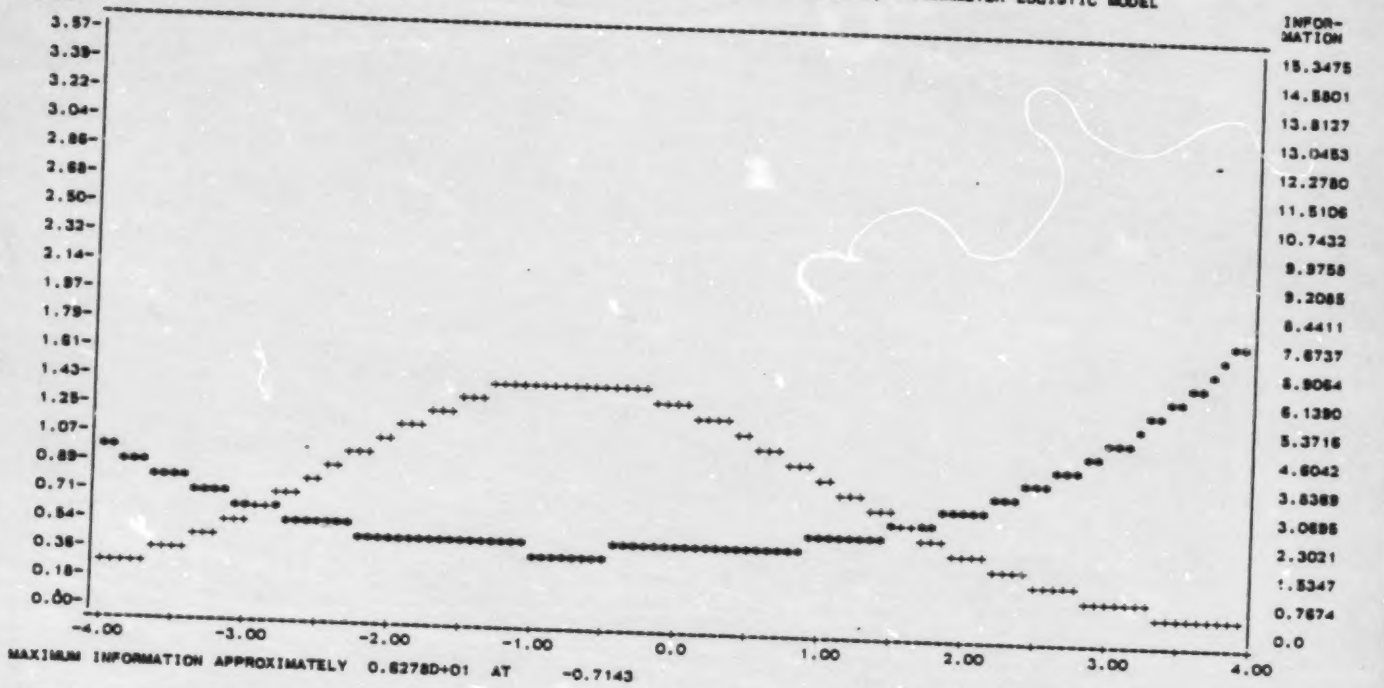


EXHIBIT H-2

TEST INFORMATION AND STANDARD ERROR CURVES FOR ARITHMETIC REASONING; 1-PARAMETER LOGISTIC MODEL

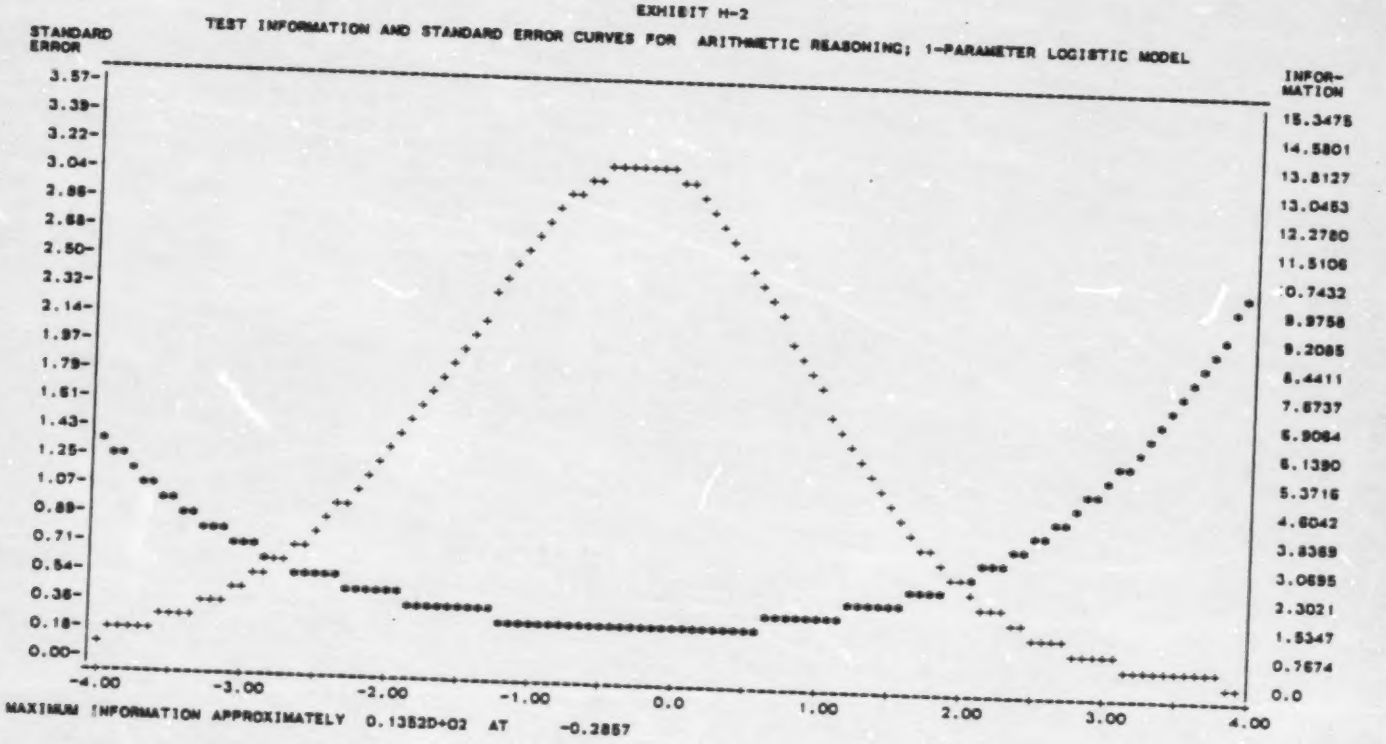
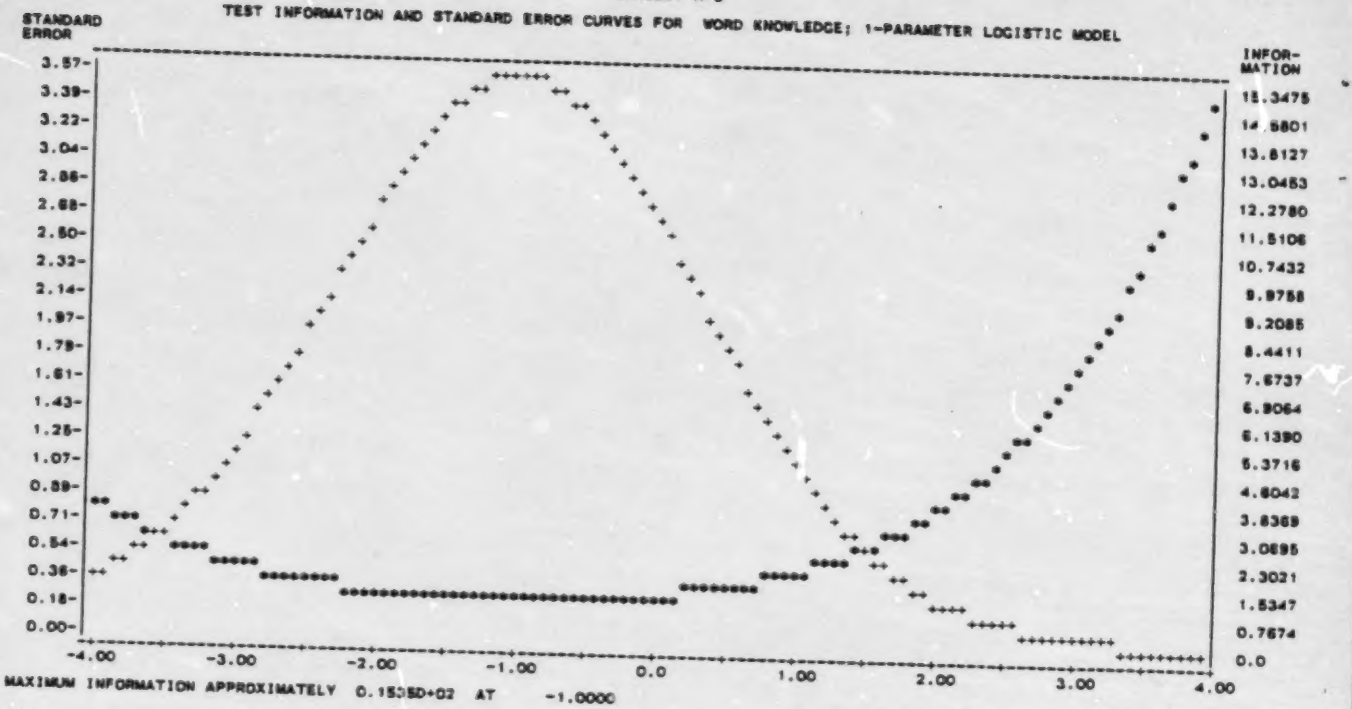


EXHIBIT H-3

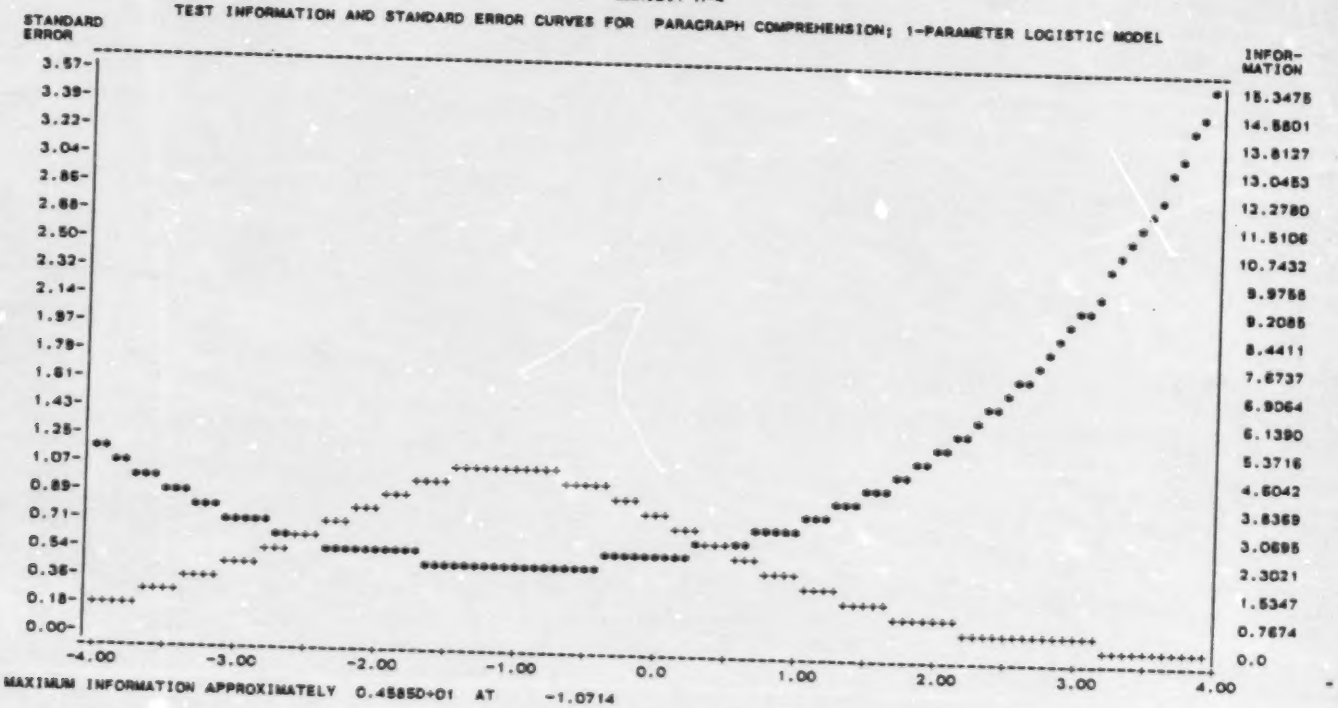
TEST INFORMATION AND STANDARD ERROR CURVES FOR WORD KNOWLEDGE; 1-PARAMETER LOGISTIC MODEL



MAXIMUM INFORMATION APPROXIMATELY 0.1535D+02 AT -1.0000

EXHIBIT H-4

TEST INFORMATION AND STANDARD ERROR CURVES FOR PARAGRAPH COMPREHENSION; 1-PARAMETER LOGISTIC MODEL



MAXIMUM INFORMATION APPROXIMATELY 0.4585D+01 AT -1.0714

EXHIBIT H-5

TEST INFORMATION AND STANDARD ERROR CURVES FOR AUTO AND SHOP INFORMATION; 1-PARAMETER LOGISTIC MODEL

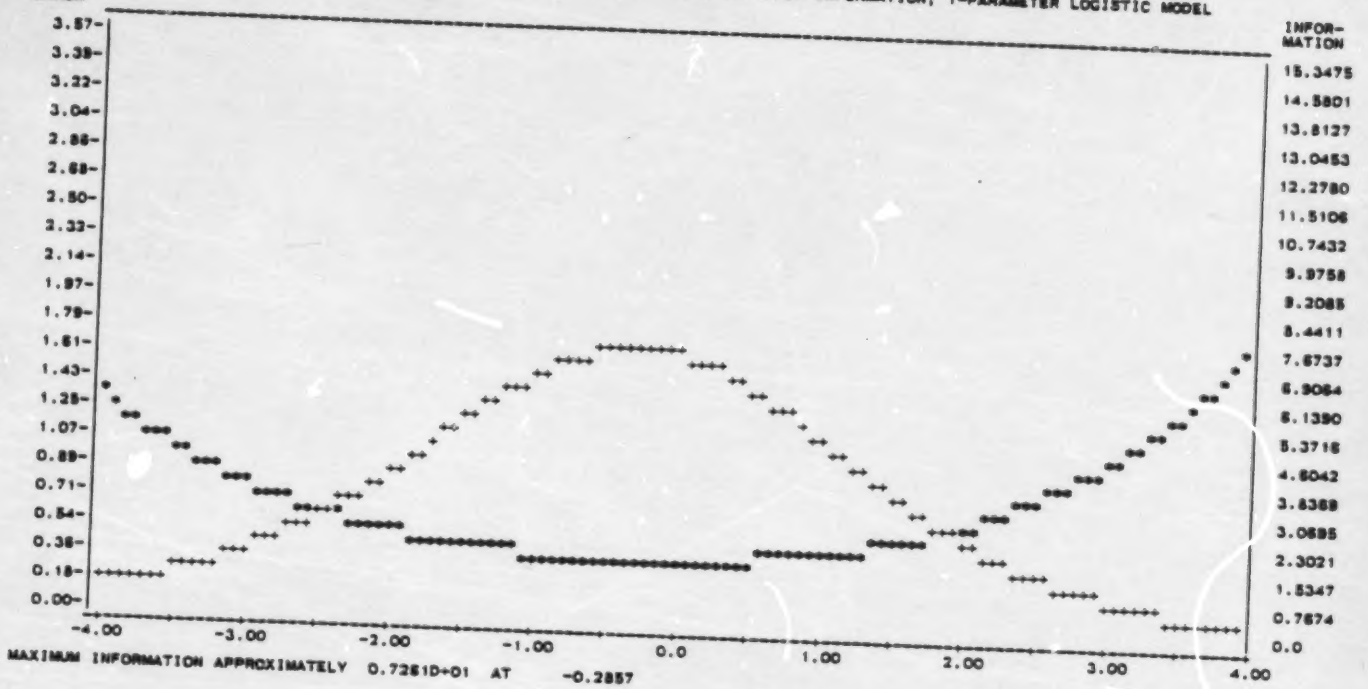


EXHIBIT H-6

TEST INFORMATION AND STANDARD ERROR CURVES FOR MATHEMATICS KNOWLEDGE; 1-PARAMETER LOGISTIC MODEL

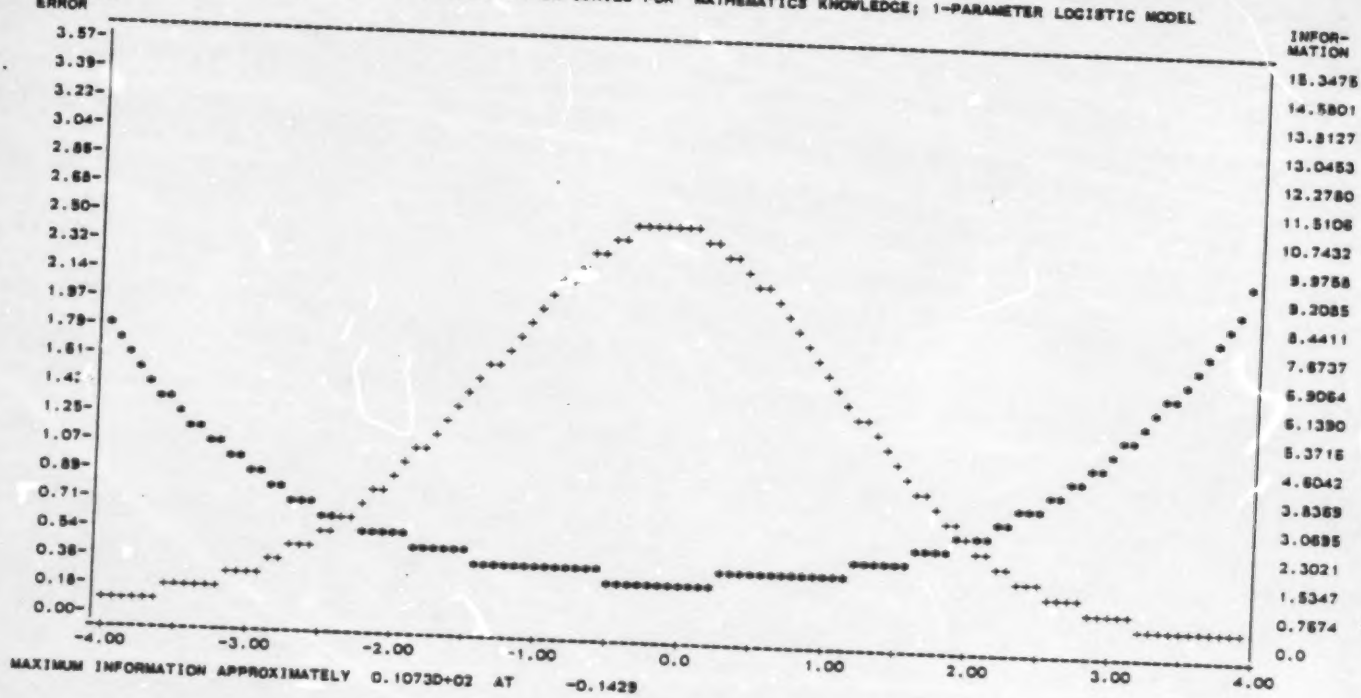
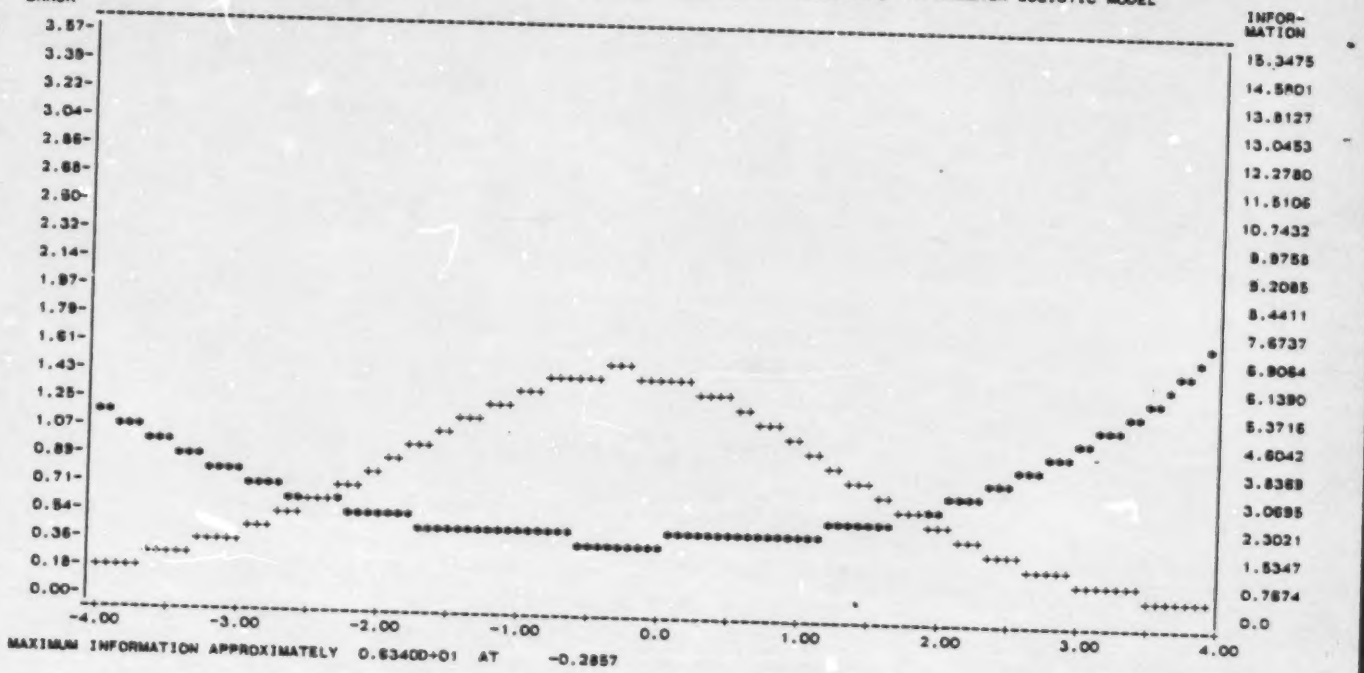


EXHIBIT H-7

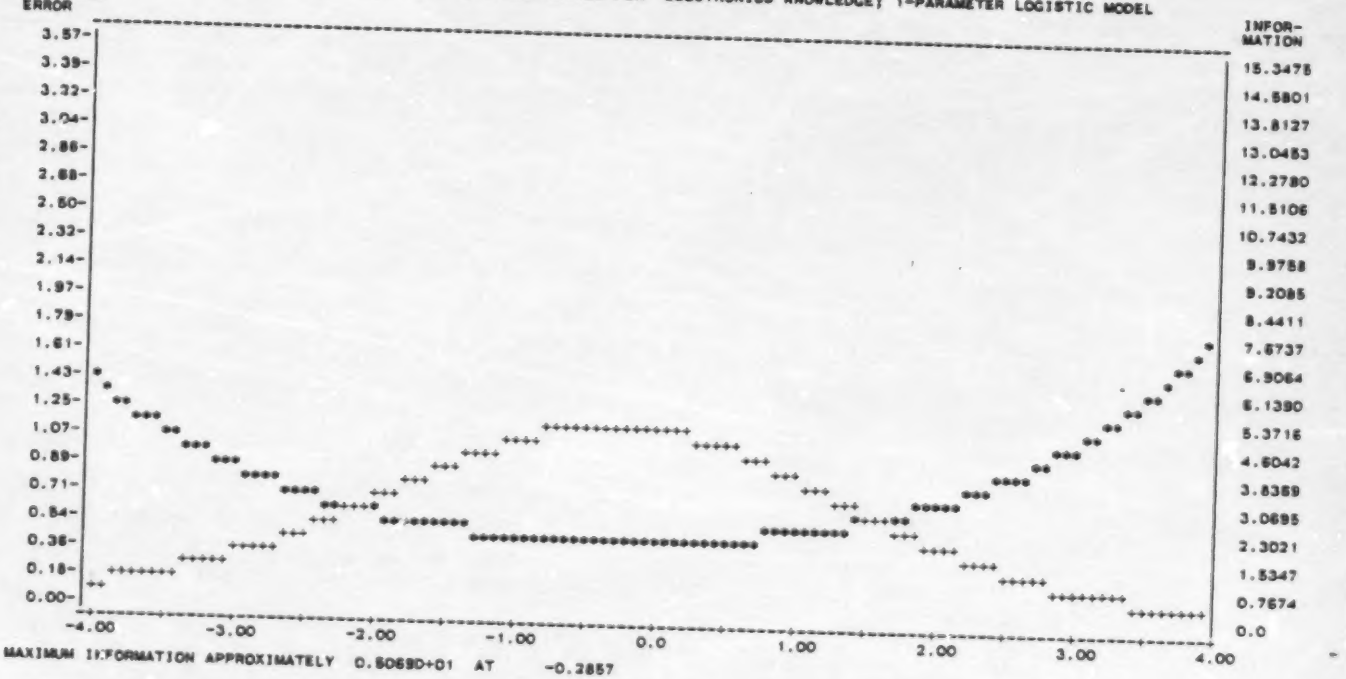
TEST INFORMATION AND STANDARD ERROR CURVES FOR MECHANICAL REASONING; 1-PARAMETER LOGISTIC MODEL



MAXIMUM INFORMATION APPROXIMATELY 0.6340D+01 AT -0.2857

EXHIBIT H-8

TEST INFORMATION AND STANDARD ERROR CURVES FOR ELECTRONICS KNOWLEDGE; 1-PARAMETER LOGISTIC MODEL



MAXIMUM INFORMATION APPROXIMATELY 0.5069D+01 AT -0.2857

APPENDIX I

TEST INFORMATION AND STANDARD ERROR CURVES, 2-PARAMETER LOGISTIC MODEL

EXHIBIT I-1

TEST INFORMATION AND STANDARD ERROR CURVES FOR GENERAL SCIENCE; 2-PARAMETER LOGISTIC MODEL

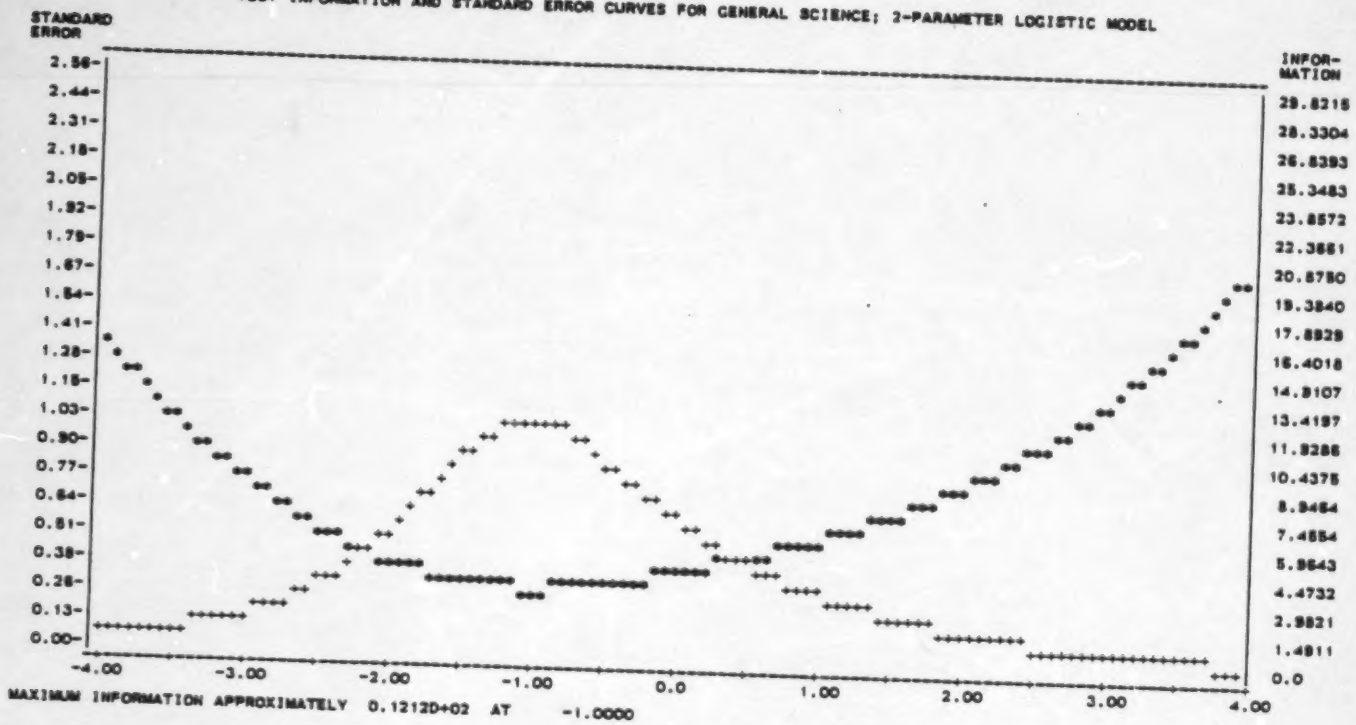


EXHIBIT I-2

TEST INFORMATION AND STANDARD ERROR CURVES FOR ARITHMETIC REASONING; 2-PARAMETER LOGISTIC MODEL

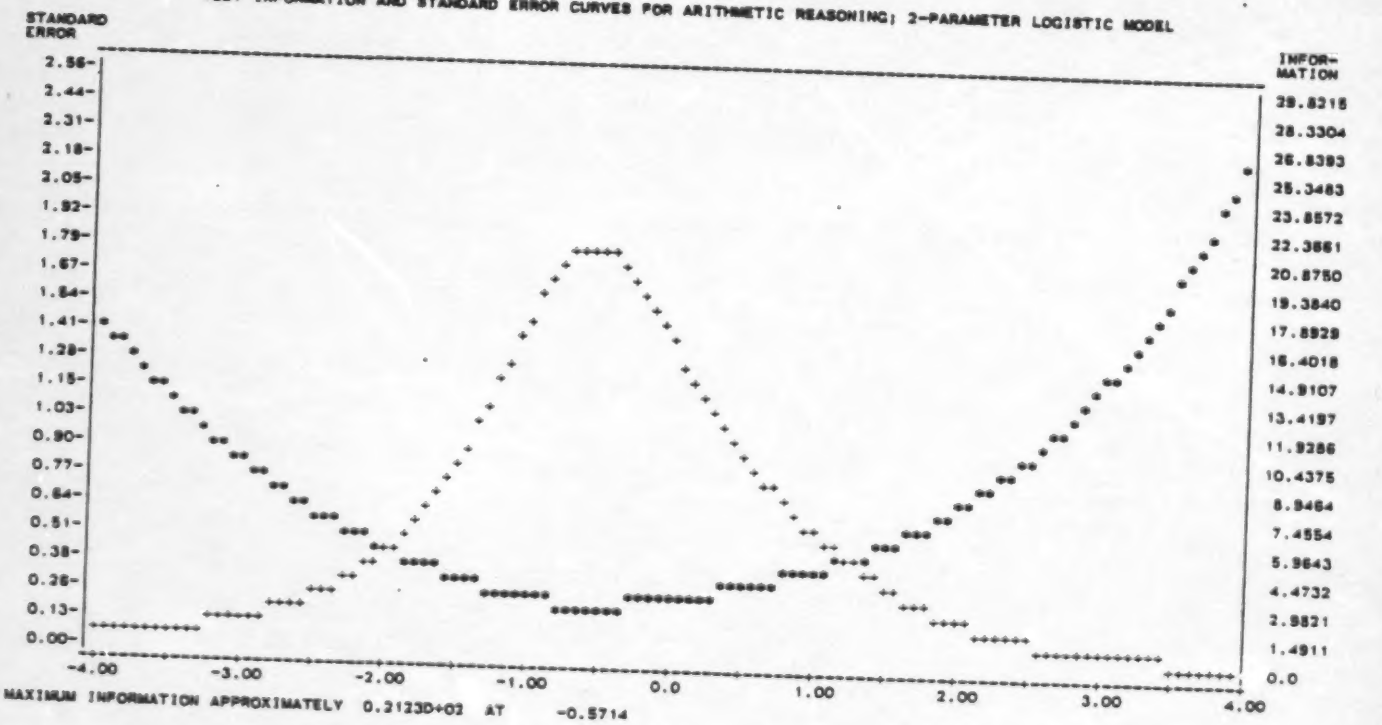


EXHIBIT I-3

TEST INFORMATION AND STANDARD ERROR CURVES FOR WORD KNOWLEDGE; 2-PARAMETER LOGISTIC MODEL

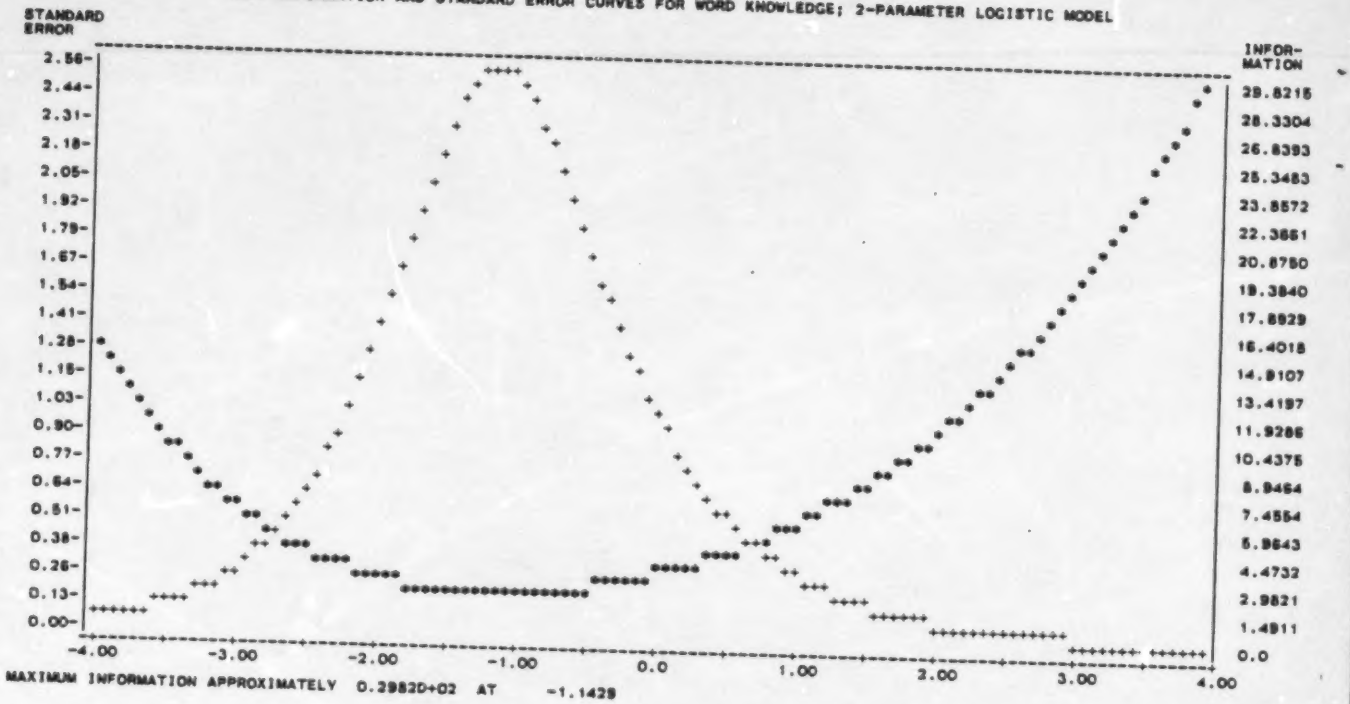


EXHIBIT I-4

TEST INFORMATION AND STANDARD ERROR CURVES FOR PARAGRAPH COMPREHENSION; 2-PARAMETER LOGISTIC MODEL

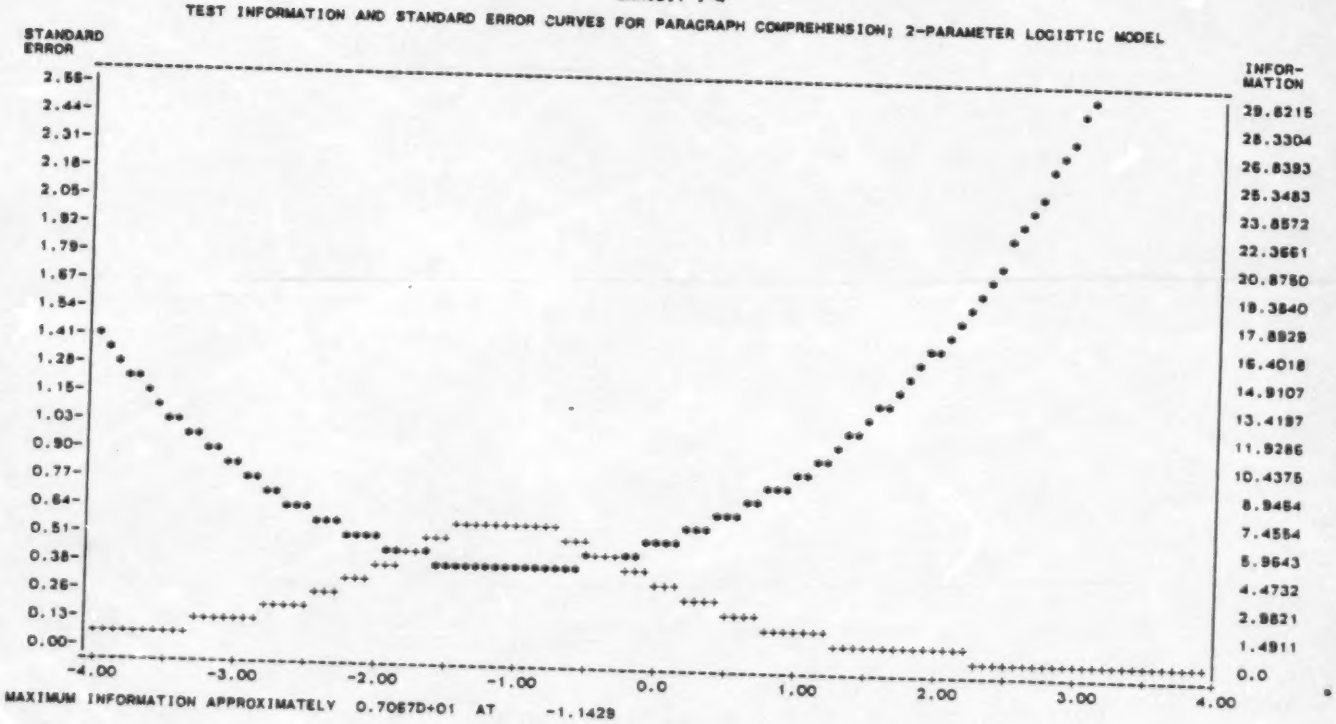


EXHIBIT I-5

TEST INFORMATION AND STANDARD ERROR CURVES FOR AUTO AND SHOP INFORMATION; 2-PARAMETER LOGISTIC MODEL

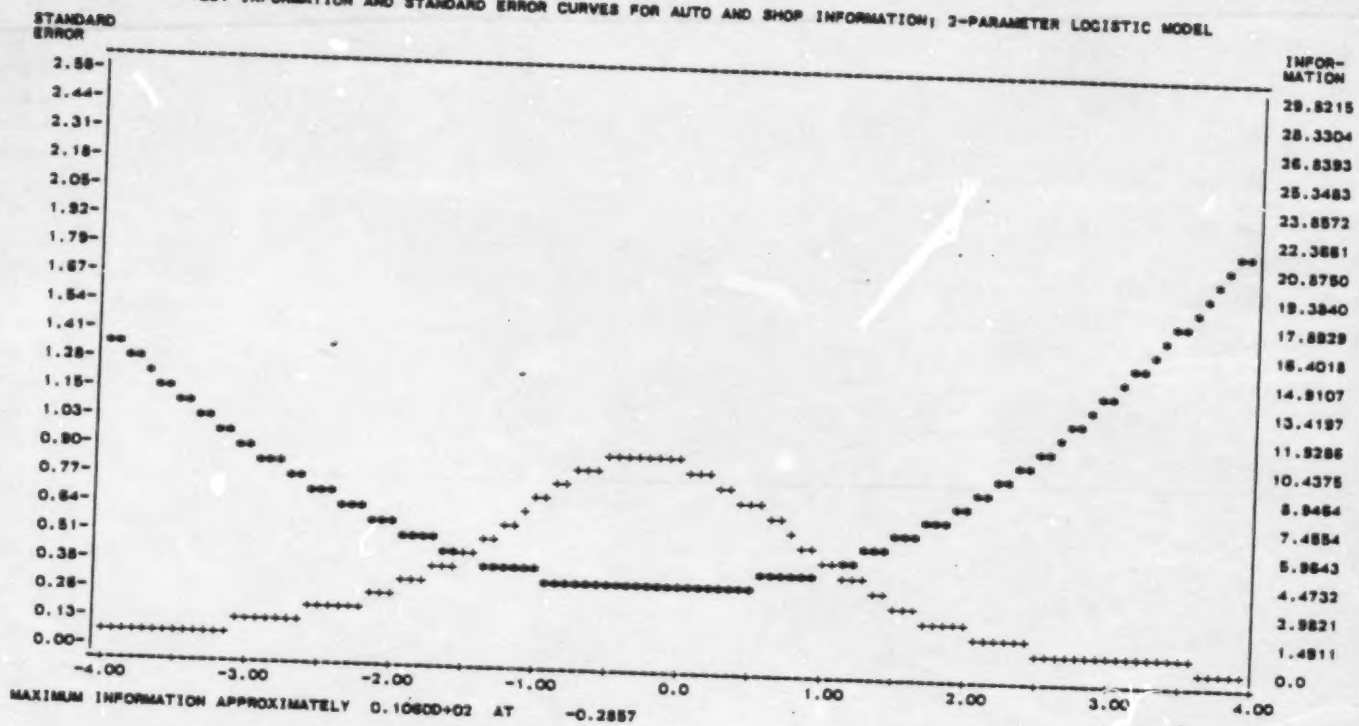


EXHIBIT I-6

TEST INFORMATION AND STANDARD ERROR CURVES FOR MATHEMATICS KNOWLEDGE; 2-PARAMETER LOGISTIC MODEL

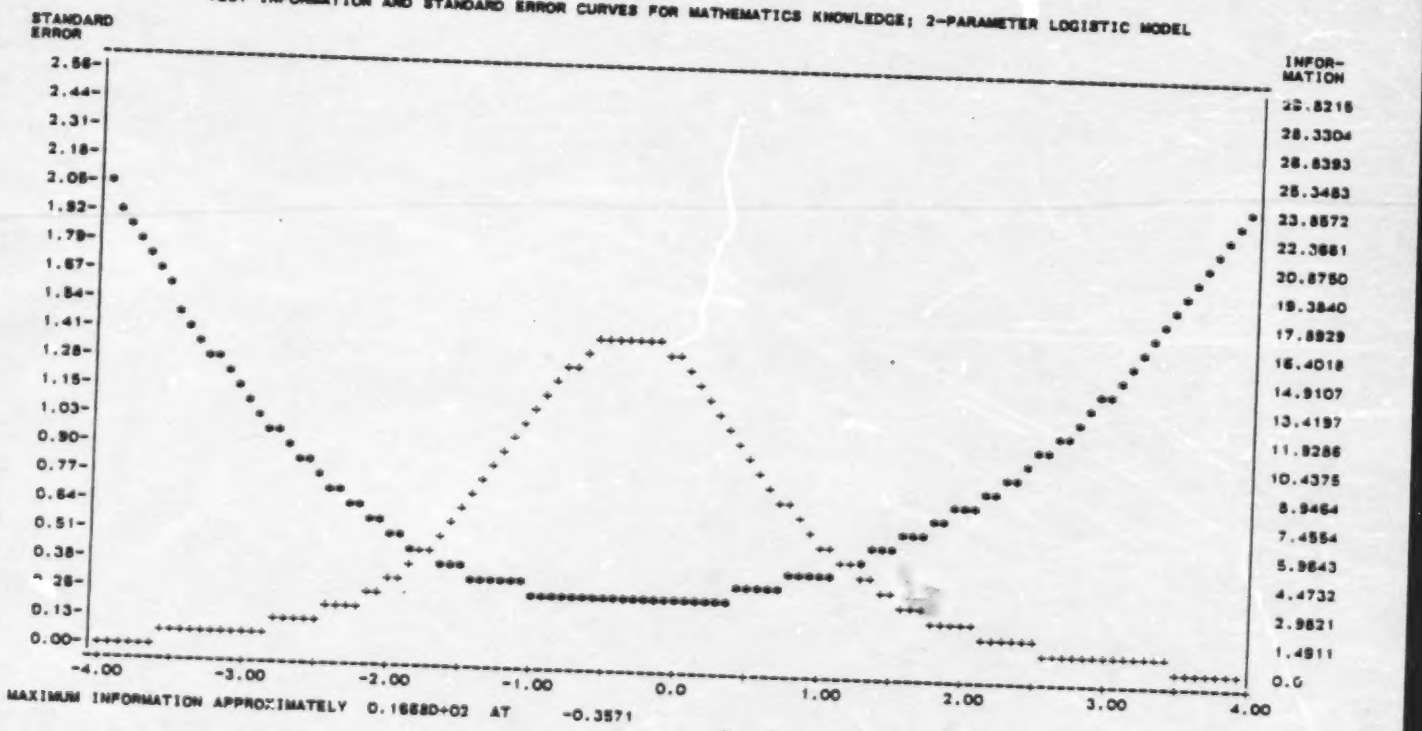


EXHIBIT I-7

TEST INFORMATION AND STANDARD ERROR CURVES FOR MECHANICAL REASONING; 2-PARAMETER LOGISTIC MODEL

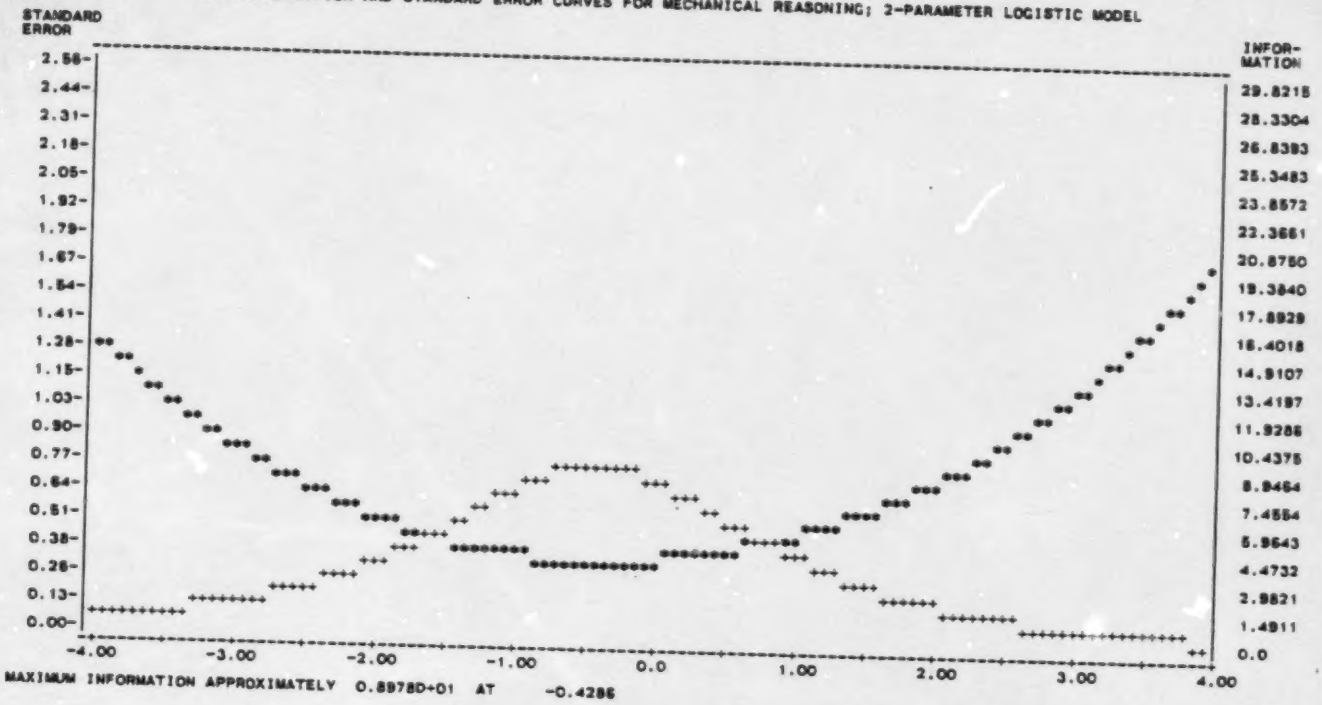
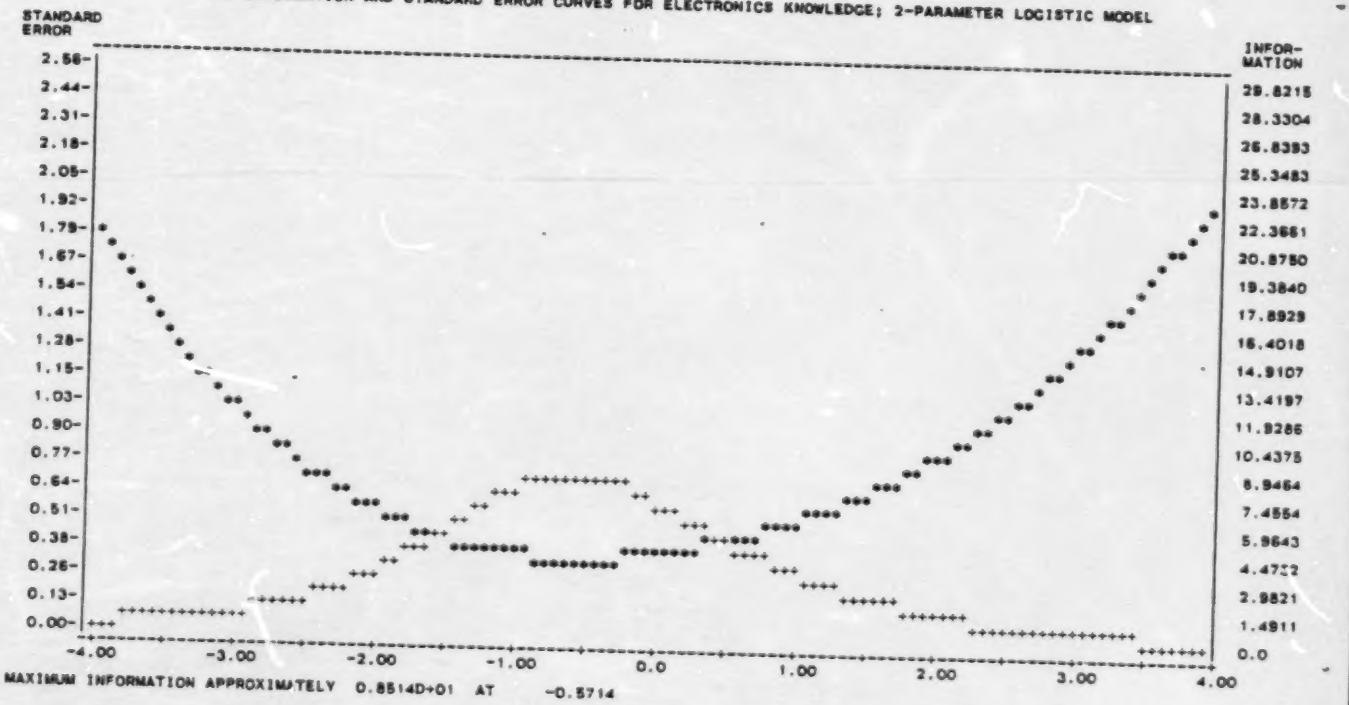


EXHIBIT I-8

TEST INFORMATION AND STANDARD ERROR CURVES FOR ELECTRONICS KNOWLEDGE; 2-PARAMETER LOGISTIC MODEL

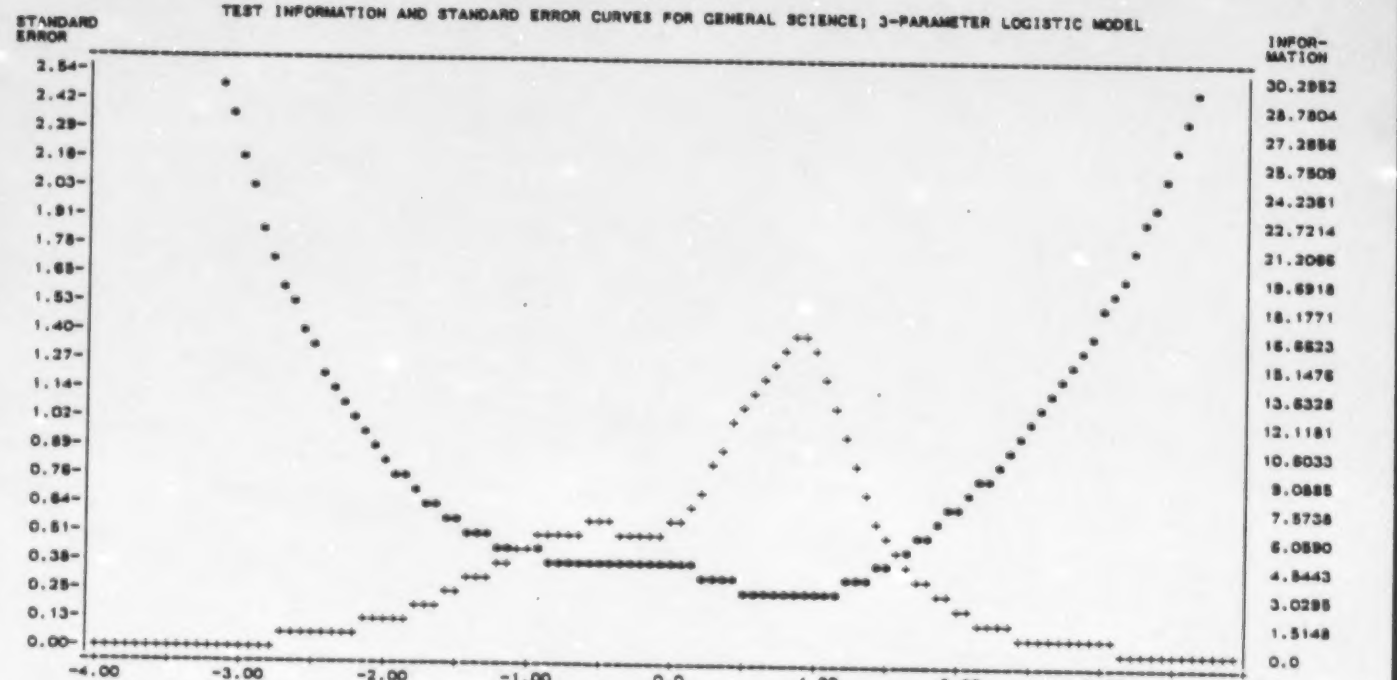


APPENDIX J

TEST INFORMATION AND STANDARD ERROR CURVES, 3-PARAMETER LOGISTIC MODEL

EXHIBIT J-1

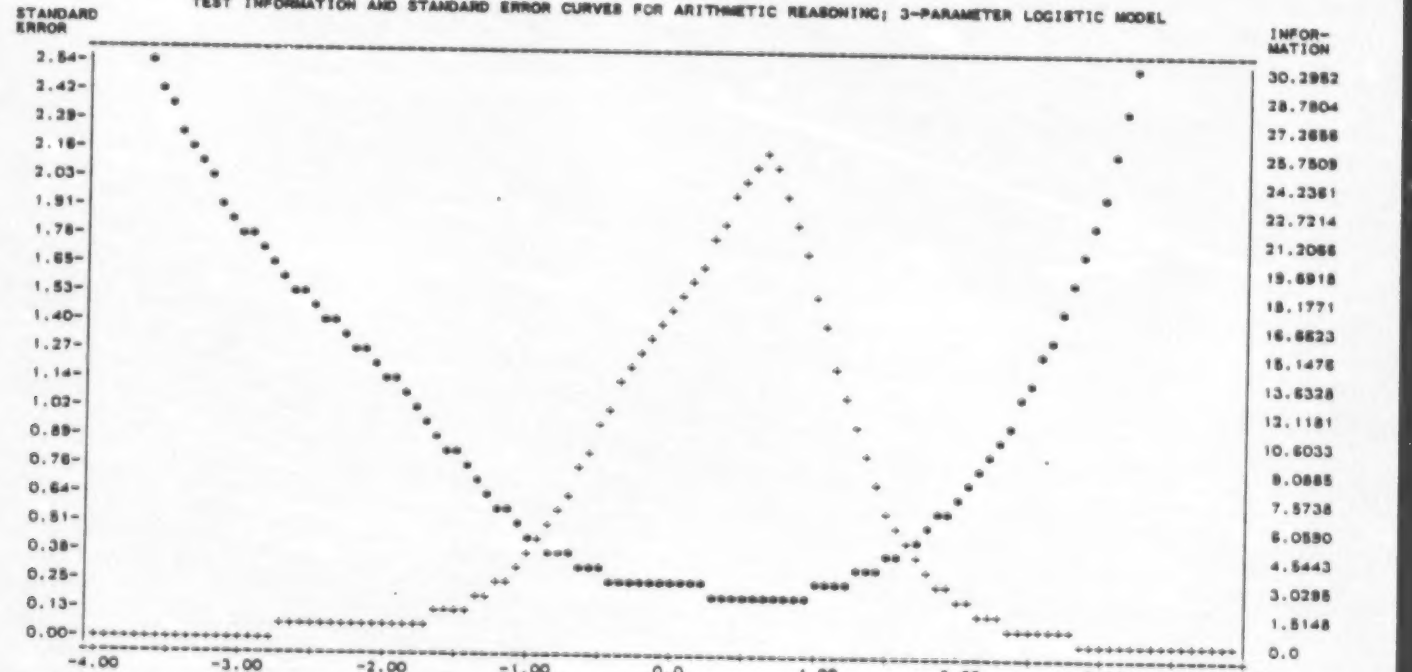
TEST INFORMATION AND STANDARD ERROR CURVES FOR GENERAL SCIENCE; 3-PARAMETER LOGISTIC MODEL



MAXIMUM INFORMATION APPROXIMATELY 0.1544D+02 AT 0.9286

EXHIBIT J-2

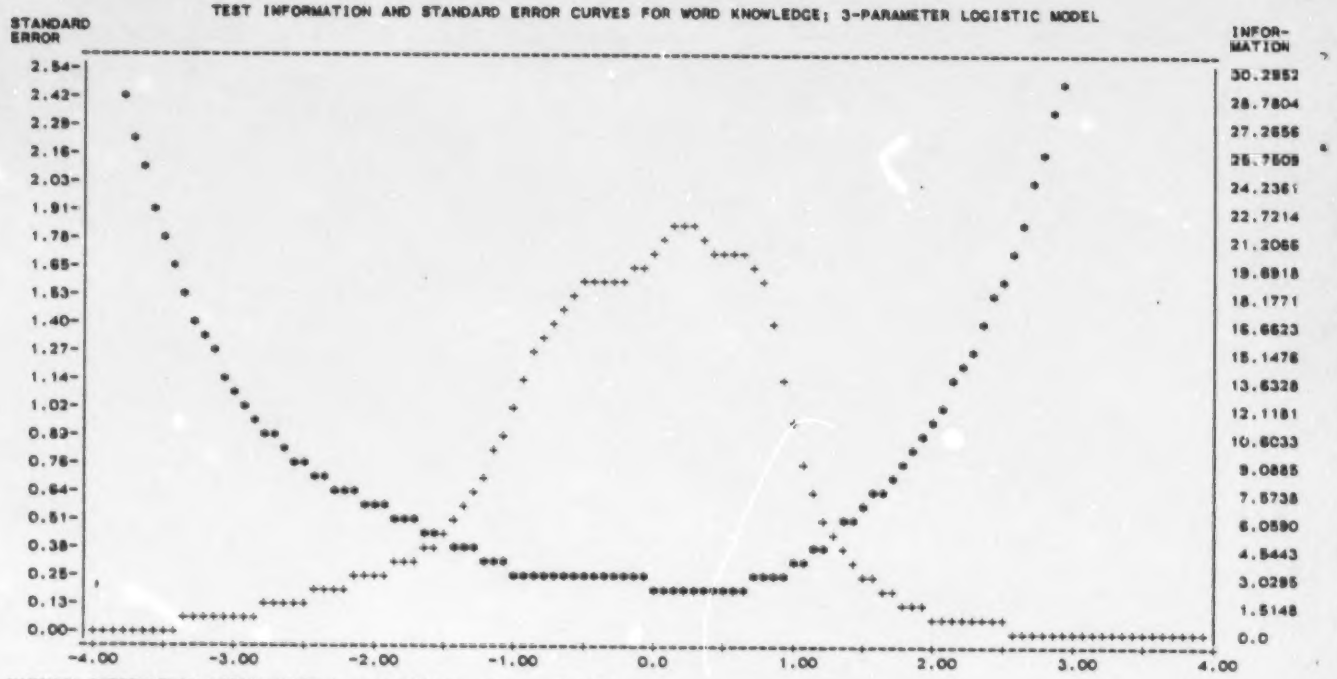
TEST INFORMATION AND STANDARD ERROR CURVES FOR ARITHMETIC REASONING; 3-PARAMETER LOGISTIC MODEL



MAXIMUM INFORMATION APPROXIMATELY 0.2542D+02 AT 0.6429

EXHIBIT J-3

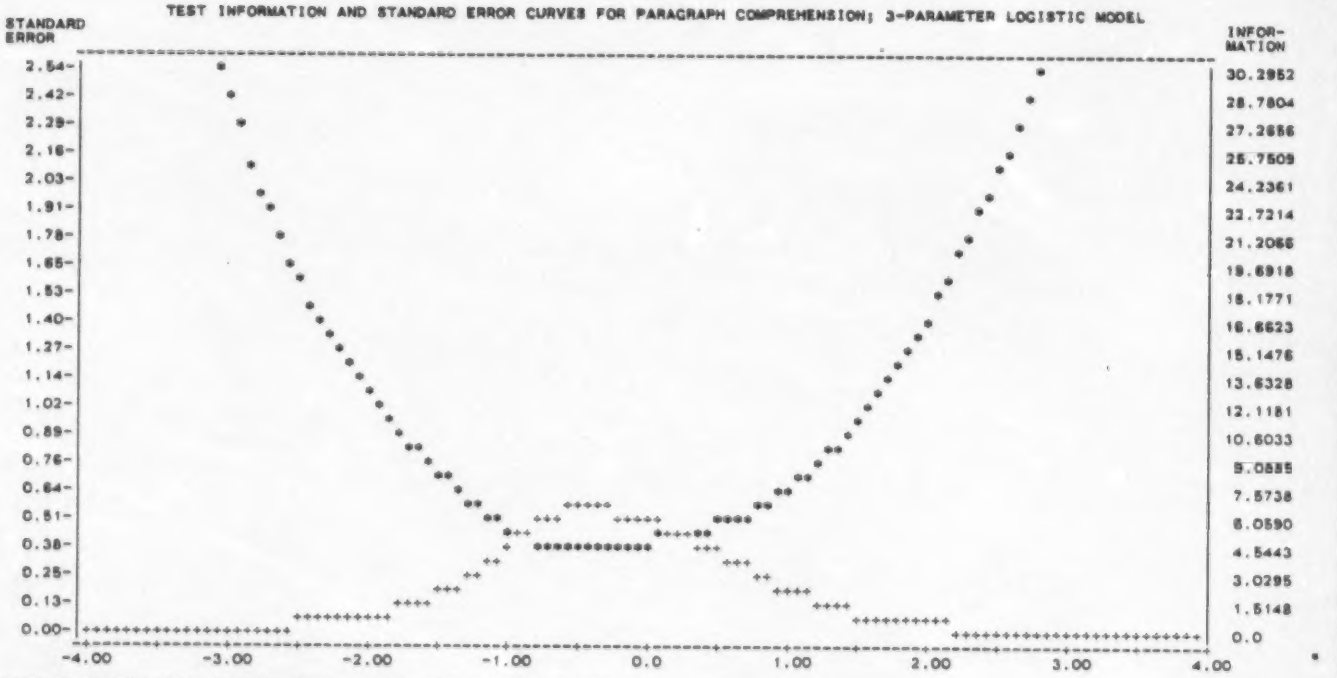
TEST INFORMATION AND STANDARD ERROR CURVES FOR WORD KNOWLEDGE; 3-PARAMETER LOGISTIC MODEL



MAXIMUM INFORMATION APPROXIMATELY 0.2187D+02 AT 0.2143

EXHIBIT J-4

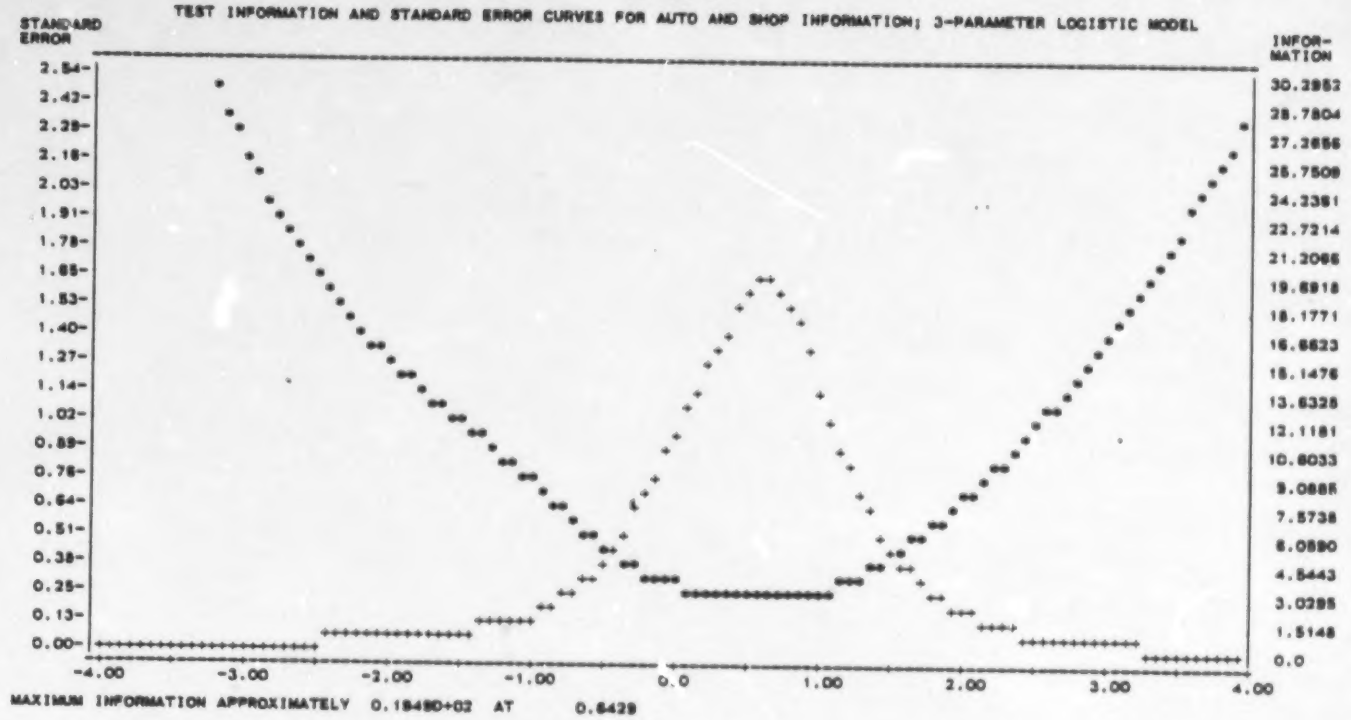
TEST INFORMATION AND STANDARD ERROR CURVES FOR PARAGRAPH COMPREHENSION; 3-PARAMETER LOGISTIC MODEL



MAXIMUM INFORMATION APPROXIMATELY 0.6585D+01 AT -0.4286

EXHIBIT J-5

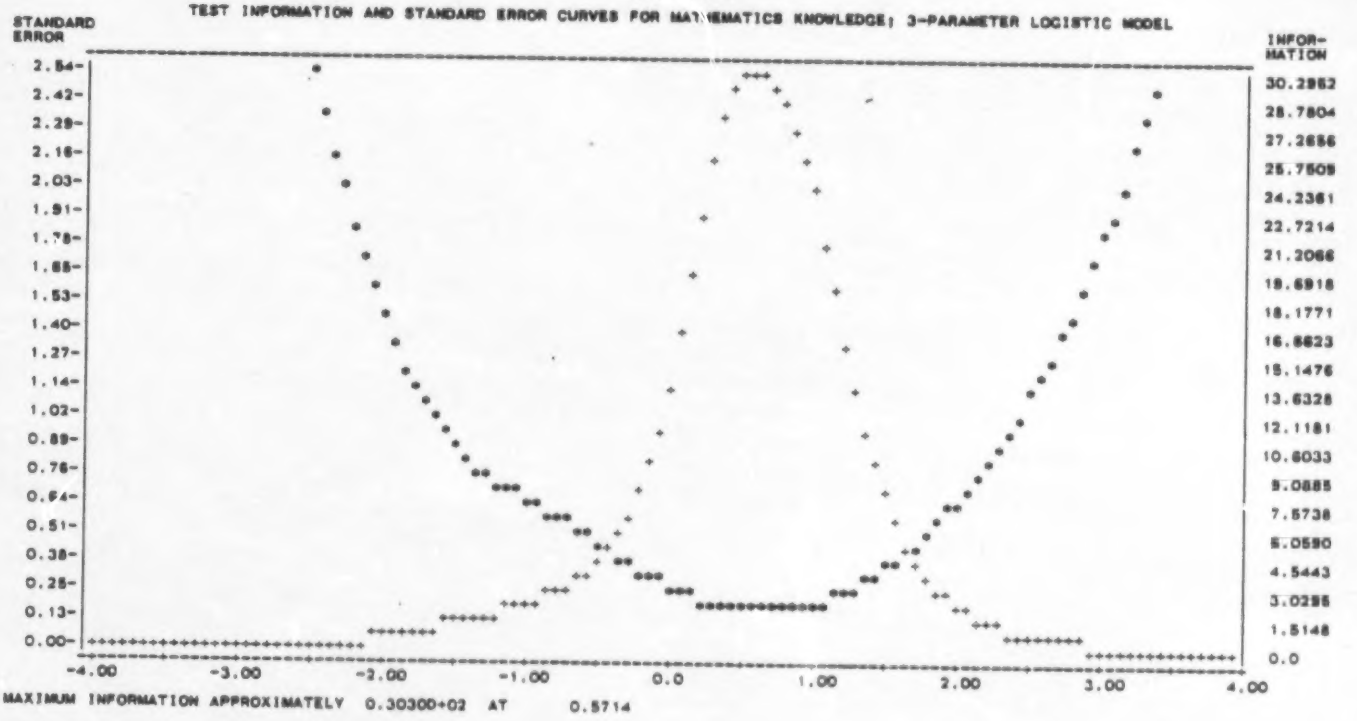
TEST INFORMATION AND STANDARD ERROR CURVES FOR AUTO AND SHOP INFORMATION; 3-PARAMETER LOGISTIC MODEL



MAXIMUM INFORMATION APPROXIMATELY 0.1848D+02 AT 0.6429

EXHIBIT J-6

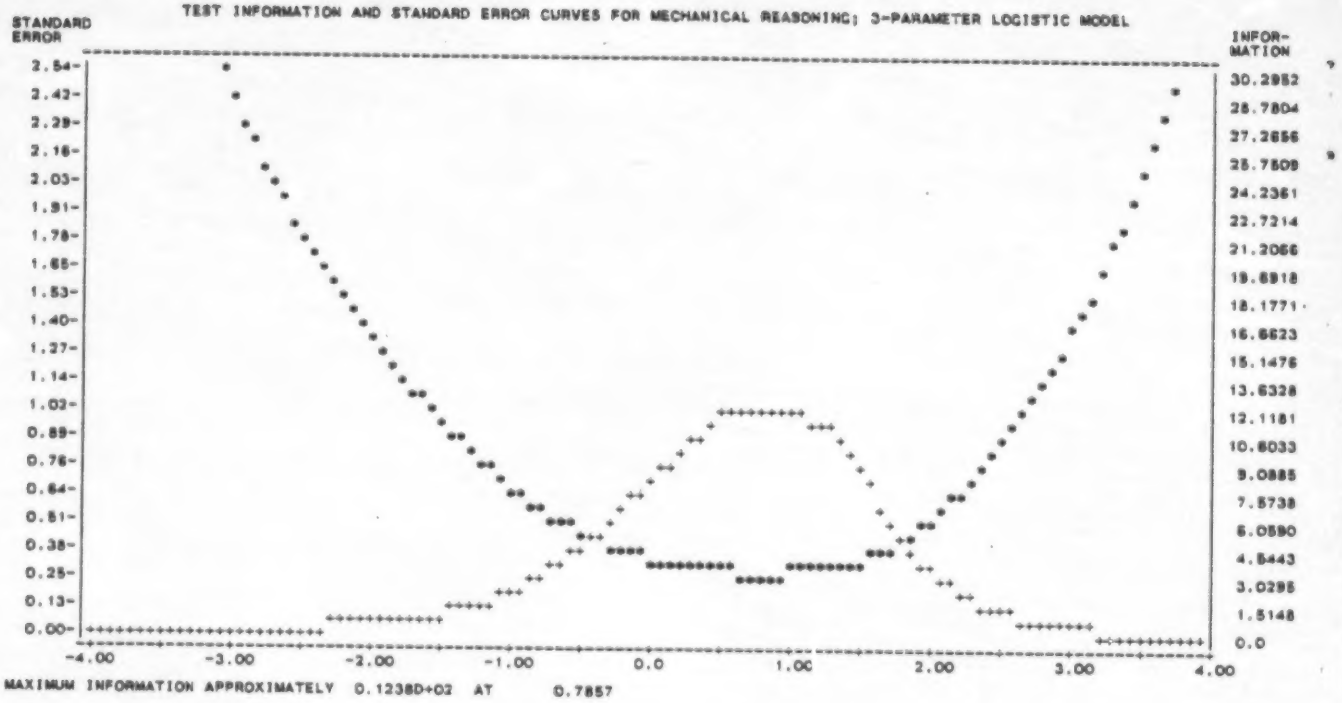
TEST INFORMATION AND STANDARD ERROR CURVES FOR MATHEMATICS KNOWLEDGE; 3-PARAMETER LOGISTIC MODEL



MAXIMUM INFORMATION APPROXIMATELY 0.3030D+02 AT 0.5714

EXHIBIT J-7

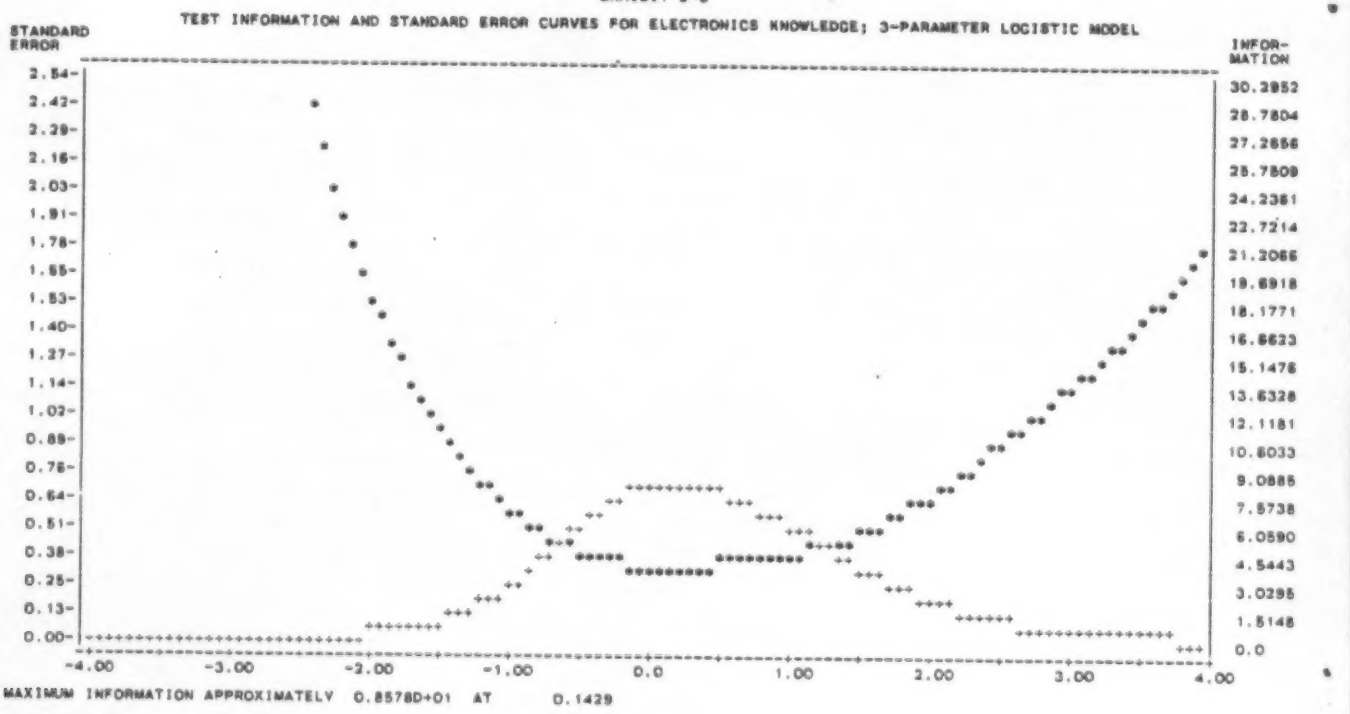
TEST INFORMATION AND STANDARD ERROR CURVES FOR MECHANICAL REASONING; 3-PARAMETER LOGISTIC MODEL



MAXIMUM INFORMATION APPROXIMATELY 0.1238D+02 AT 0.7857

EXHIBIT J-8

TEST INFORMATION AND STANDARD ERROR CURVES FOR ELECTRONICS KNOWLEDGE; 3-PARAMETER LOGISTIC MODEL



MAXIMUM INFORMATION APPROXIMATELY 0.8578D+01 AT 0.1429